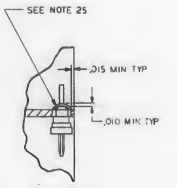
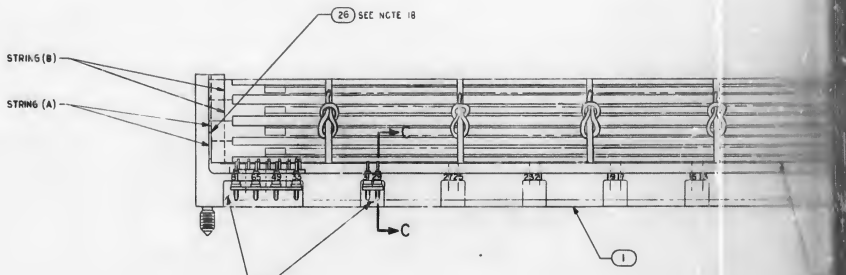
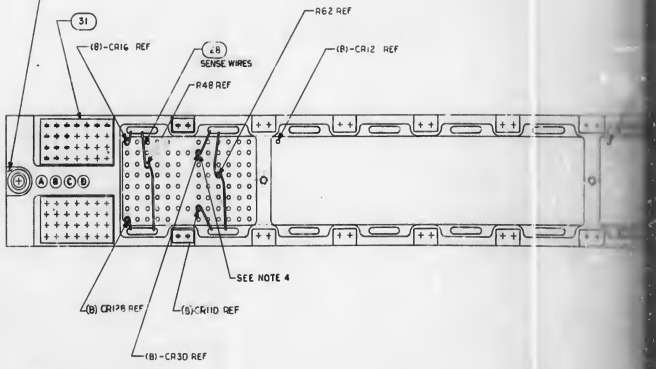


SECTION C-C
SCALE 4/1
88 PLACES





NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ~~ALL WIRED CONNECTIONS TO BE MADE PER ND 1002005 EXCEPT AS~~ 1002003
3. WIRE PER ND 1002029
4. ALL SOLDERING CONNECTIONS TO BE MADE PER ND 1002071 USING SOLDER PER ND1002075 EXCEPT DO NOT TIN LEADS OF FIND NO.28 AND SOLDER WRAPS TO BE 2-4 TURNS USING FIND NO.28
5. ~~BOND FIND NO.10 TO FIND NO.1 PER ND 1002004 TYPE I~~
6. ~~BOND FIND NO.9 TO SUBSTRATE PER ND 1002004 TYPE I~~
7. ~~FILL KEYING HOLES AS INDICATED IN CHART WITH THERMALLY CONDUCTIVE EPOXY RESIN ND1000183 DO NOT EVACUATE AFTER FILLING~~
8. ~~WHITE DOT DENOTES LEAD TO BE CUT FOR FIRST LEVEL WIRING~~
9. ~~BLACK DOT DENOTES LEAD TO BE CUT FOR SECOND LEVEL WIRING~~
10. ~~K DENO TES CATHODE SIDE OF DIODE~~
11. AR DENOTES AS REQUIRED
12. INDICATED AREAS TO BE FREE OF ENCAPSULATING COMPOUND
13. ENCAPSULATE MODULE PER NO 1002226 _ INDICATED AREA ONLY
14. MARK 08J0 HIGH PER ND 1002019 & ND 1002122, TYPE II, CLASS 2 USING WHITE MARKING NK 1006271-1
15. MARK 24J6 HIGH PER ND 1002019 & ND 1002122, TYPE II, CLASS 1 USING WHITE MARKING NK 1006271-1
16. MARK APPROPRIATE MODULE NO. IN ACCORDANCE WITH "8" NO. AS SHOWN IN DASH NO. COL IN PARTS LIST
17. SELECT FIND NO. 12 NOTED "A" AND "B", EXAMPLE (A)-CR5 AND (B)-CR6, PER ~~THE ELECTRICAL EQUIVALENT, AT A FORWA... CURRENT OF 10 mA ± 2%, AND AT FORWARD CURRENT OF 10 mA ± 2% THE VOLTAGE DROP ACROSS BOTH DIODES SHALL BE WITHIN 3 MV OF EACH OTHER~~
18. USE PART OF FIND NO. 26 TO ELIMINATE SPACE BETWEEN CORE HOLDERS AND INSIDE BOTH ENDS OF HEADER
19. ASSEMBLE FIND NO. 15 TO CORE HOLDERS USING MIL-S-22473, GRADE HV
20. ~~WIRE PER WIRING DIAGRAM (SEE SHEET 2)~~
21. ~~ENCAPSULATE MODULE PER ND1000002 (BLACK POLYURETHANE FOAM) INDICATED AREAS ONLY~~
22. ~~MICROSTRIP TYPE 1, 2 LINE AND TWISTED~~
23. SENSE LINE WIRING PER MODULE DECK NO. DESIGNATED
24. ~~MARK APPLICABLE PROGRAM NUMBER ONLY, DASH NUMBER NOT REQUIRED~~
25. SEAL TERMINALS & INSULATORS TO HEADER PER 1002226
26. WRAP & TIE AROUND WIRED ASSY APPROXIMATELY AS SHOWN WITH ONE WRAP OF FIND NO. 34

1003733 L

LTR	DESCRIPTION	APPROVED
A	REVISED PER TDRR [illegible]	
B	REVISED PER TDRR [illegible]	
C	REVISED PER TDRR 15537	
D	REVISED PER TDRR 16819	
E	REVISED PER TDRR [illegible]	
F	REVISED PER TDRR 18040	
G	REVISED PER TDRR 18697	
H	REVISED PER TDRR 23139	
J	REVISED PER TDRR 23152	
K	REVISED PER TDRR 25158	
L	REVISED PER TDRR 27076	

SEE NOTE 25

.015 MIN TYP

.010 MIN TYP

SECTION C-C
SCALE 4/1
88 PLACES

SEE NOTE 12

15 SEE NOTE 19

17

23

18

22

19

VIEW A-A

STRING (B)

STRING (A)

26 SEE NOTE 18

34 SEE NOTE 26

28 REF

A

35

5

C

C

SEE NOTE 13

A

1

24

32

SEE NOTE 12

31

(B)-CR16 REF

28 SENSE WIRES

R62 REF

R48 REF

(B)-CR12 REF

(B)-CR4 REF

PIN NO.1

W

X

Y

Z

A B C D

SEE NOTE 4

(B) CR28 REF

(B)-CR110 REF

(B)-CR30 REF

SEE NOTE 13

241	231	221	211	191	181	171	161	151	141	131	121	111	091	081	071	061	051	041	031	F41	QTY /UNIT	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
B22	B29	B26	B24	B23	B22	B21	B25	B28	B24	B23	B22	B21	B29	B28	B22	B23	B28	B21	B29	B28	B21			
AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0036	REF
—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0035	REF
—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0034	REF
—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0033	REF
—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0032	REF
—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0031	REF
—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0030	REF
—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0029	REF
—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0028	REF
—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0027	REF
—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0026	REF
—	—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0025	REF
—	—	—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0024	REF
—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0022	REF
—	—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0021	REF
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	—	—	—	—		SEE NOTE 23	MODULE DECK NO. 0023	REF
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1003821-021	ROPE MEMORY MODULE SUBASSY	35
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR		1012507-003	TAPE, LACING	34
																						1005320	CORE, MAGNETIC	33
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	—	AR	—		SEE NOTE 23	MODULE DECK NO. 0018	REF
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	AR	—		SEE NOTE 23	MODULE DECK NO. 0020	REF
—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	AR	—	AR		SEE NOTE 23	MODULE DECK NO. 19	REF
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16		1004727	GASKET ROPE MODULE	32
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		1004*26	GASKET ROPE MODULE	31
																						SEE NOTE 27	WIRE, ELECTRICAL	30
																						SEE NOTE 29	WIRE, ELECTRICAL	29
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR		1006275-2	WIRE, ELECTRICAL	28
																						1000093-2	SCREW, BUTTON HD	27
AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR	AR		1004623-2	SHIM	26
																						1005776-2	SLEEVING	25
REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF	REF		1006144	SCHEMATIC	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1004603	INSULATOR	24
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		1004546-3	WASHER, FLAT	23
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		MS16633-4015	RING, RETAINING, EXTERNAL TE	22
																					2	MS35066-100	PIN, SPRING	21
																					2	[illegible]	SCREW, EVISION DRIVE CYLINDER	20
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		1004579-1	SCREW, JACKING	19
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2		1004546-1	WASHER, FLAT	18
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		1004237	WASHER, FLAT	17
																					8	[illegible]	SCREW, FLAT HEAD	16
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8		1005783-1	SCREW, BUTT... HEAD	15
																AR	AR	AR	AR	AR		1006275-2	WIRE, ELECTRICAL	14
																2.5	2.5	2.5	2.5	2.5		1006787-2	WIRE, AWG #020	13
																256	256	256	256	256		1006781	DIODE	12
																128	128	128	128	128		1004*38	CORE, MEMORY	11
																1	1	1	1	1		1003119	TERMINAL BOARD ASSEMBLY	10
																					8	1006*_581	CORE, MAGNETIC	9
																AR	AR	AR	AR	AR		1004118	PLUG, KEYING	8
																1	1	1	1	1		1004254	INSULATOR	7
																1	1	1	1	1		1004246-3	INSULATOR	6
																					1	1003121-011	ROPE MEMORY MODULE SUB ASSY	5
																AR	AR	AR	AR	AR		1004235	HOLDER, CORE	4
																1	1	1	1	1		1004*36	MOLDED COMPONENT	3
																1	1	1	1	1		1004236	COVER	2
																1	1	1	1	1		1003133	HEADER ASSEMBLY	1

LIST OF MATERIALS

1021103

1021106

NEXT ASSY | USED ON | APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± | DECIMALS ± | ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREAT
FINISH

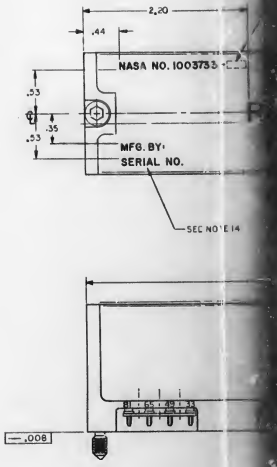
INSTRUMENTATION LAB
Cambridge, Mass.
DRAWN [illegible] DATE
CHECKED
APPROVED
APPROVAL
NASA APPROVAL
ART APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE ASSEMBLY

CODE IDENT NO. 80230 | SIZE J | NASA DRAWING NO. 1003733
SCALE 2/1 | WT | SHEET 1 OF 2

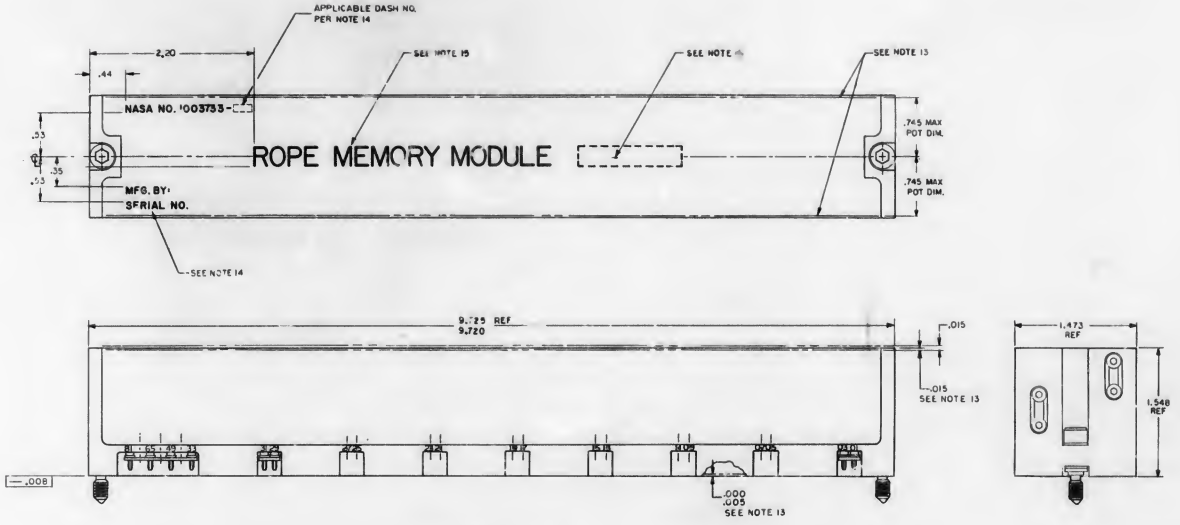
1003733 L SHEET 1 OF 2



1003733	L	SHEET 2 OF 2

1003733 K

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR		
B	REVISED PER TDRR		
C	REVISED PER TDRR		
D	REVISED PER TDRR 16879		
E	REVISED PER TDRR 17264		
F	REVISED PER TDRR		
G	REVISED PER TDRR 18697		
H	REVISED PER TDRR 23139		
J	REVISED PER TDRR 23952		
K	REVISED PER TDRR 25158		
L	REVISED PER TDRR 27076		



MARKING & POTTING VIEW

QTY PER	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ±.02 ± DO NOT SCALE THIS DRAWING MATERIAL — HEAT TREATMENT — FINISH —	NEXT ASSY USED ON APPLICATION

NTS

INSTRUMENTATION LAB
Cambridge Mass

DRAWN Heilmann DATE
CHECKED
APPROVAL
APPROVAL

NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE ASSEMBLY

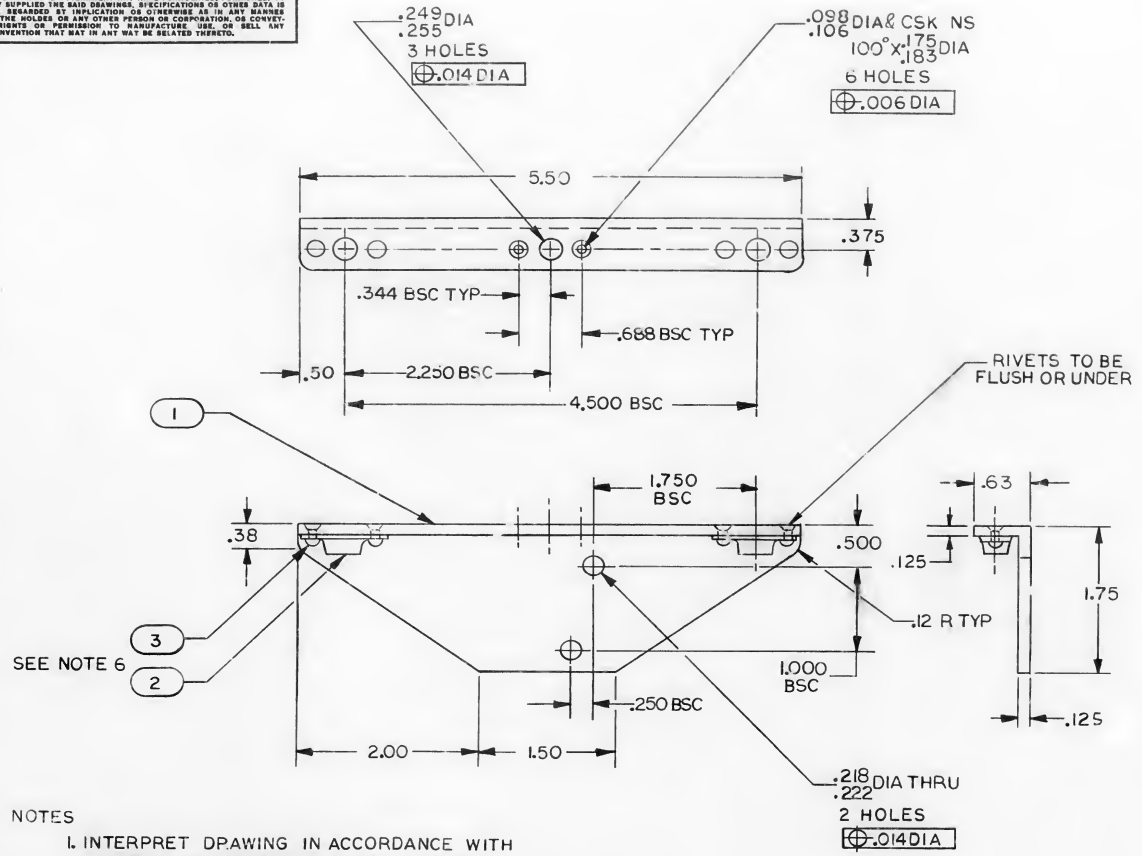
CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	J	1003733

SCALE 2/1 WT SHEET 2 OF 2

1003733 L

1003733 L SHEET 2 OF 2

REVISIONS 13673						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: ALUMINUM ALLOY, EXTRUDED ANGLE, 6063-T5 PER QQ-A-200/9
3. FINISH: PLATE (ELECTRODEPOSITED) ALL SURFACES PER QQ-C-320, CLASS 2, TYPE II, PLATING TO BE .0004 TO .0008 THICK, HARDNESS ROCKWELL C60 MIN. DIMENSIONS APPLY AFTER PLATING. SPECIFIED THICKNESS NOT REQUIRED IN ALL HOLES AS LONG AS PLATING IS CONTINUOUS THROUGH EACH HOLE.
4. SURFACE QUALITY 125 ALL OVER
5. REMOVE ALL BURRS AND BREAK SHARP EDGES .005/.015
6. ASSEMBLE FIND NO. 2 TO FIND NO. 1 USING FIND NO. 3 AFTER PLATING
7. IDENTIFY PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
6	MS20426AD3-5		RIVET, COUNTERSUNK HEAD	3
3	NAS 686 — C08M		NUT, FLOATING ANCHOR	2
1	1003734-001		FRONT PANEL MOUNT	1

LIST OF MATERIALS

1003700	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS XXX ± .005 XX ± .01 ANGLES ± 1°
DO NOT SCALE THIS DRAWING 2

MATERIAL

SEE NOTE 2

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

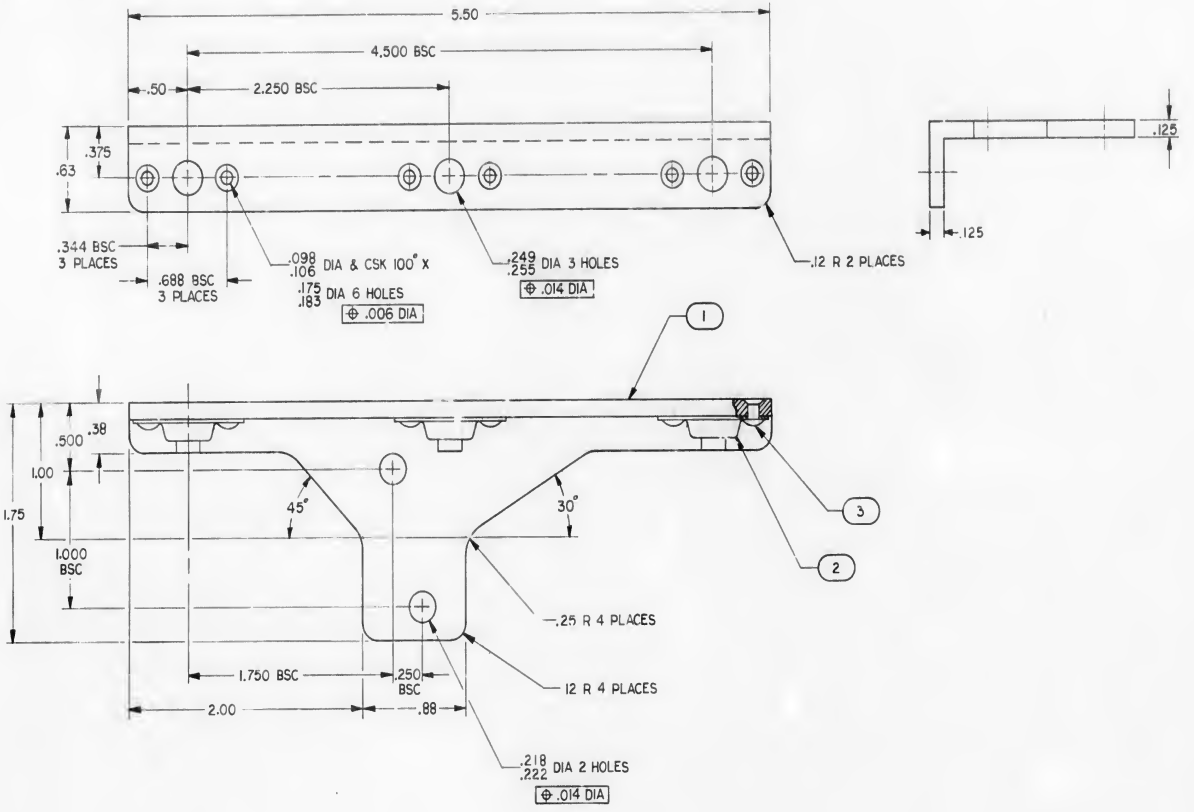
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN	L. Pokoni	8 OCT 64
CHECKED	R. Kingsbury	19 OCT 64
APPROVED		
APPROVED	Edson C. Hall	7 Oct 64
APPROVED MIT		
APPROVED MSC		

FRONT PANEL MOUNT ASSEMBLY LEFT SIDE AGC

CODE IDENT NO.	SIZE	DRAWING NO.
——	C	1003734
DATE	SCALE 1/1	SHEET 1 OF 1

REVISIONS 13673			
SYM	DESCRIPTION	DATE	APPROVAL



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: ALUMINUM ALLOY, EXTRUDED ANGLE 6063-T5 PER QQ-A-200/9
3. FINISH: PLATE (ELECTRODEPOSITED) ALL SURFACES PER QQ-C-320, CLASS 2, TYPE II, PLATING TO BE .0004 TO .0008 THICK, HARDNESS ROCKWELL MIN C60. DIMENSIONS APPLY AFTER PLATING. SPECIFIED THICKNESS NOT REQUIRED IN ALL HOLES AS LONG AS PLATING IS CONTINUOUS THROUGH EACH HOLES
4. SURFACE QUALITY 125/ ALL OVER
5. REMOVE ALL BURRS AND BREAK SHARP EDGES .005/.015
6. ASSEMBLE FIND NO. 2 TO FIND NO. 1 USING FIND NO. 3 AFTER PLATING
7. IDENTIFY PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
6	MS20425AD3-5	RIVET, COUNTERSUNK HEAD	3
3	NAS 686-C08M	NUT, ANCHOR, FLOATING	2
1	1003735-001	FRONT PANEL MOUNT	1

LIST OF MATERIALS

NEXT ASSY	USED ON
1003700	
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — XXX ± .005 ± 1/2
XX ± .01
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE 2
HEAT TREATMENT
—
FINAL FINISH
SEE NOTE 3

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN DeGioia DATE Oct 64
CHECKED E. Kingsbury 19 Oct 64
APPROVAL
APPROVAL Edmund C Gaull 19 Oct 64

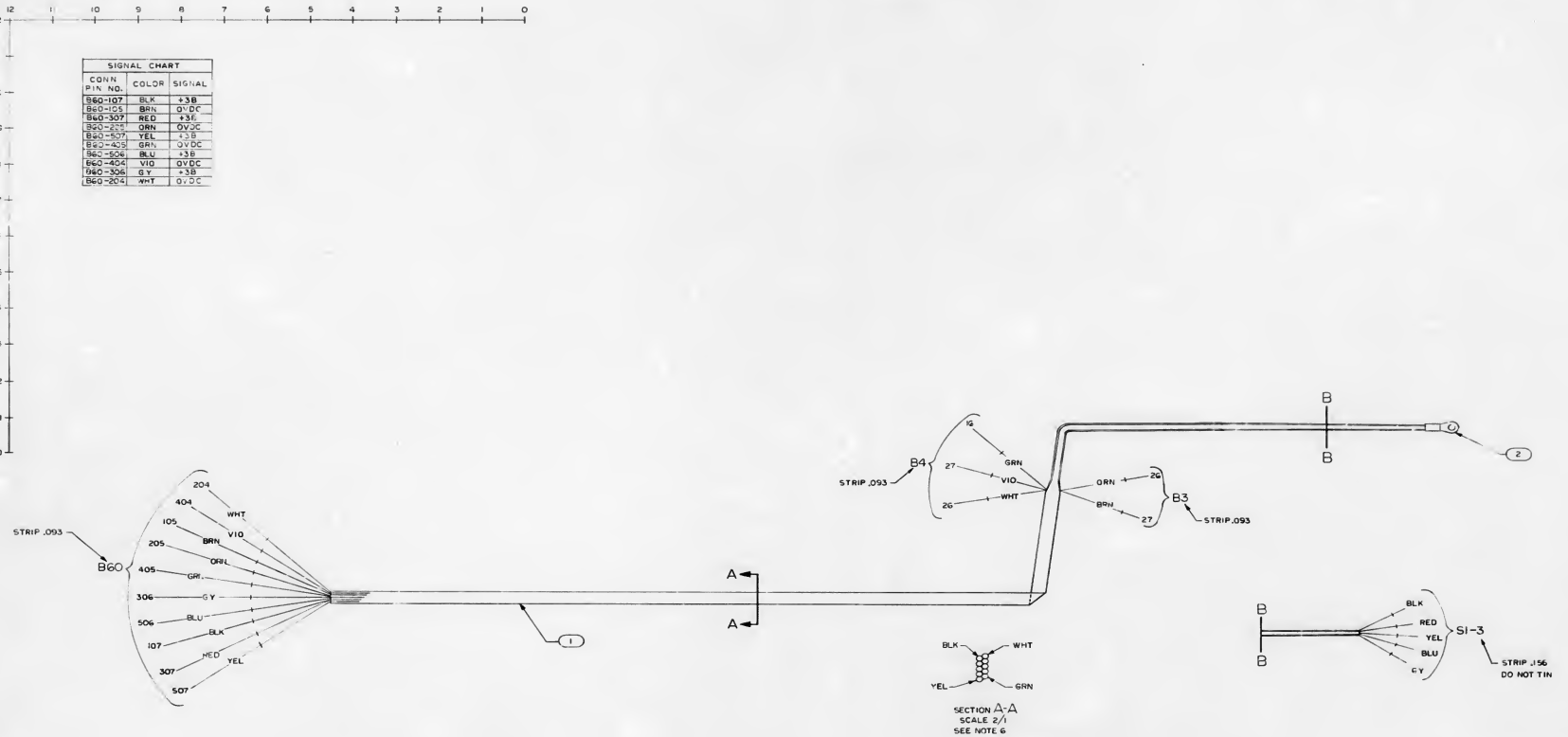
FRONT PANEL MOUNT
RIGHT SIDE
AGC

NASA APPROVAL [signature] 10-20-64
MIT APPROVAL [signature] 10/20/64

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1003735
SCALE 2/1 WT — SHEET 1 OF 1

REVISIONS					
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED

SIGNAL CHART		
CONN PIN NO.	COLOR	SIGNAL
B60-107	BLK	+3B
B60-105	BRN	0VDC
B60-307	RED	+3B
B60-205	ORN	0VDC
B60-507	YEL	+3B
B60-405	GRN	0VDC
B60-506	BLU	+3B
B60-404	VIO	0VDC
B60-306	GY	+3B
B60-204	WHT	0VDC



NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TESTS SEE ND1002032
3. AR DENOTES AS REQUIRED
4. IDENTIFY PER ND1002019
5. INSTALL FIND NO.2 PER ND1002019
6. FOLD FIND NO.1 AS SHOWN IN SECTION A-A

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
1	MS25036-6		TERMINAL, LUG	2
AR	1006292-2		WIRE, ELECTRICAL, (FLAT CABLE)	1

LIST OF MATERIALS

1003701 NEXT ASSY	USED ON APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES CAPACITOR VALUES ARE IN μf RESISTOR VALUES ARE IN OHMS TOLERANCES ON FRACTIONS DECIMALS ANGLES .x ± .xx ± .xxx ± DO NOT SCALE THIS DRAWING MATERIAL

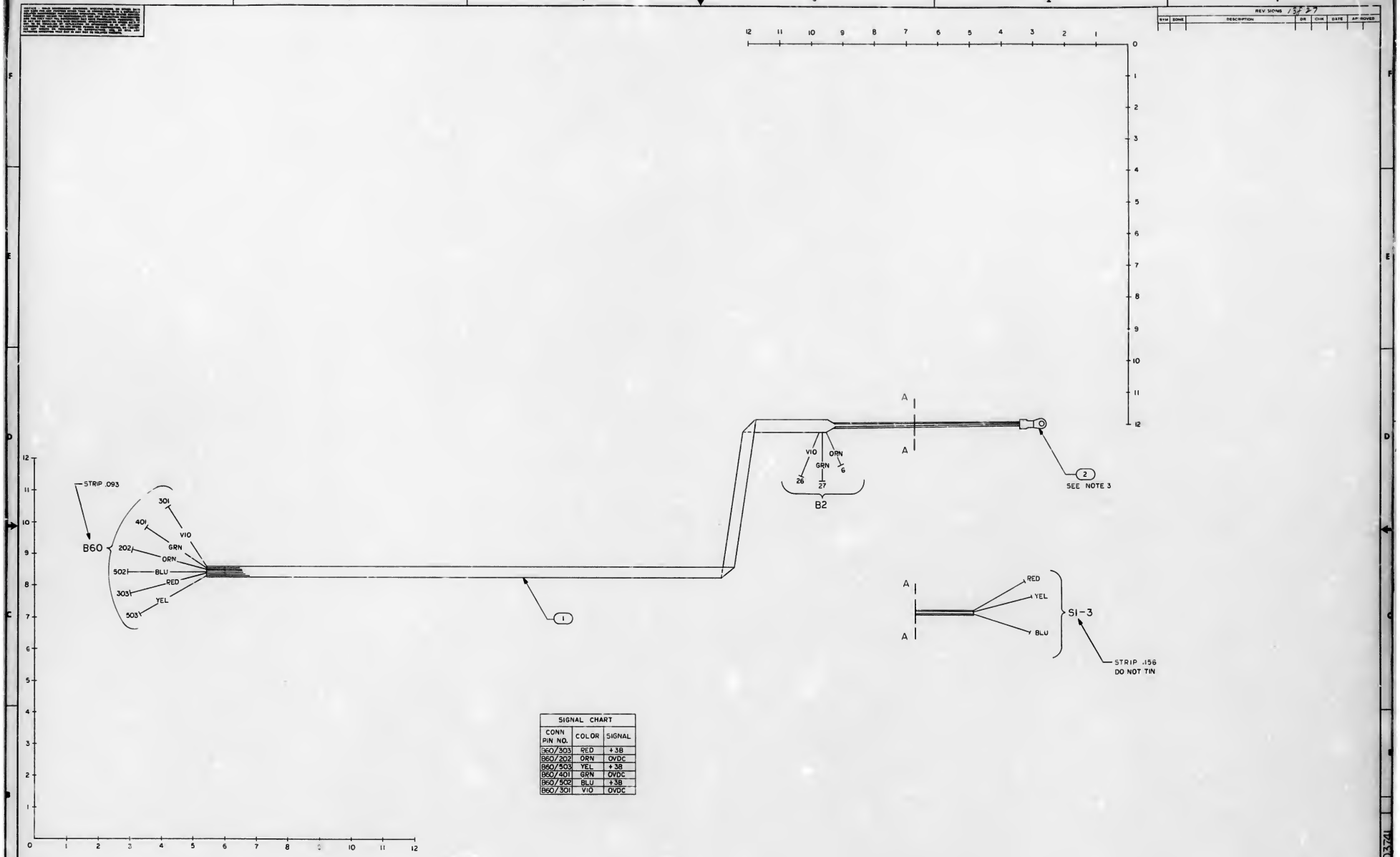
MIT INSTRUMENTATION LAB (CHARLES STARK DRAPER LABORATORY)	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DRAWN	
CHECKED	
APPROVED	
APPROVED	
APPROVED MIT	
APPROVED MSC	

FLAT CABLE A (TRAY B)

CODE IDENT NO. — SIZE E — DRAWING NO. 1003740

DATE — SCALE 1/1 — SHEET 1 OF 1

1003740



SIGNAL CHART		
CONN PIN NO.	COLOR	SIGNAL
360/303	RED	+38
360/202	ORN	0VDC
360/503	YEL	+38
360/401	GRN	0VDC
360/502	BLU	+38
360/301	VIO	0VDC

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TESTS SEE ND 1002032
3. INSTALL FIND 2 PER ND 1002206
4. AR DENOTES AS REQUIRED
5. IDENTIFY PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
1	MS25036-1		TERMINAL, LUG	2
AR	1006292-2		WIRE, ELECTRICAL (FLAT CABLE)	1

LIST OF MATERIALS

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

FLAT CABLE B (TRAY B)

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. CAPACITOR VALUES ARE IN μf. RESISTOR VALUES ARE IN OHMS. TOLERANCES ON FRACTIONS ± DECIMALS ANGLES .XXX ± .XX ± —. DO NOT SCALE THIS DRAWING. MATERIAL

DRAWN R. Kinsley 4 OCT 65
CHECKED R. Kinsley 4 OCT 65
APPROVED
APPROVED Thomas Hall 10 Oct 65
APPROVED MIT [signature] 10 Oct 65
APPROVED NASA [signature] 10-26-65
DATE

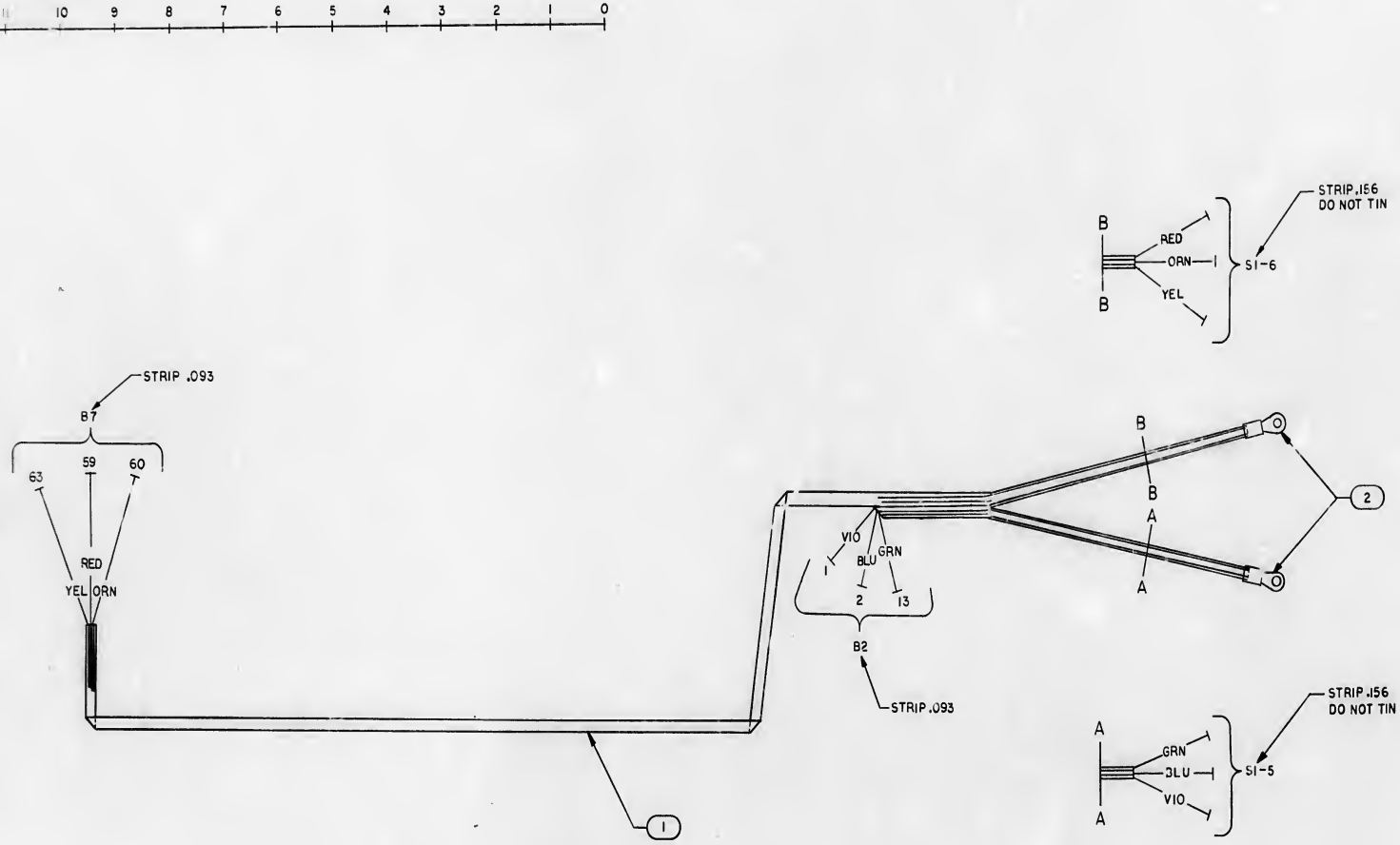
1003701
NEXT ASSY | USED ON
APPLICATION

CODE IDENT NO | SIZE E | DRAWING NO. 1003741

SCALE 1/1 | SHEET 1 OF 1

1425001

REVISIONS (13P2)			
SYM	DESCRIPTION	DATE	APPROVAL



SIGNAL CHART		
CONN PIN NO	COLOR	SIGNAL
B7-59	RED	B PLUS B
B7-60	ORN	B PLUS B
B7-63	YEL	B PLUS B
B2-13	GRN	B PLUS A
B2-2	BLU	B PLUS A
B2-1	VIO	B PLUS A

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TEST SEE ND 1002032
3. INSTALL FIND NO.2 PER ND 1002206
4. AR DENOTES AS REQUIRED
5. IDENTIFY PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
2	MS25036-1	TERMINAL, LUG	2
AR	1006292-1	WIRE, ELECTRICAL, (FLAT CABLE)	1

LIST OF MATERIALS

1003701	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS .XXX ± .060 .000 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO. CONTRACT
DRAWN L.D. Williams DATE 1 MAY 64
CHECKED A.D. Ros 20 DEC 64
APPROVAL
APPROVAL Edw. C. Hall 20 DEC 64
NASA APPROVAL W.J. Johnson 1 JAN 65
MIT APPROVAL

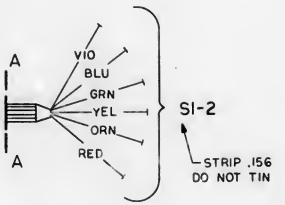
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

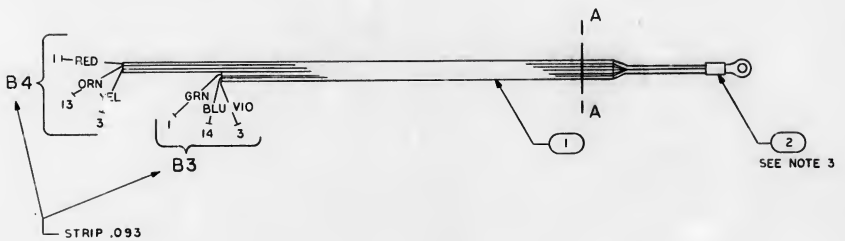
FLAT CABLE C (TRAY B)

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1003742
SCALE 1/1
WT —
SHEET 1 OF 1

REVISIONS 13727			
SYM	DESCRIPTION	DATE	APPROVAL

SIGNAL CHART		
CONN PIN NO.	COLOR	SIGNAL
B3-3	VIO	+3A
B3-1	GRN	
B3-14	BLU	
B4-1	RED	
B4-13	ORN	
B4-3	YEL	+3A





NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TESTS SEE ND 1002032
3. INSTALL FIND 2 PER ND 1002206
4. AR DENOTES AS REQUIRED
5. IDENTIFY PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
1	MS25036-6	TERMINAL, LUG	2
AR	1006292-1	WIRE ELECTRICAL (FLAT CABLE)	1

LIST OF MATERIALS

1003701	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — XXX ±.060 ± —
.000
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DRWG. NO. CONTRACT
DRAWN J. Crowley DATE 30 Oct 68
CHECKED E. Bird 20 OCT 69
APPROVAL
APPROVAL Elden C. Hall 20 Oct 69
NASA APPROVAL W. J. Rhyne 10-21-69
MIT APPROVAL

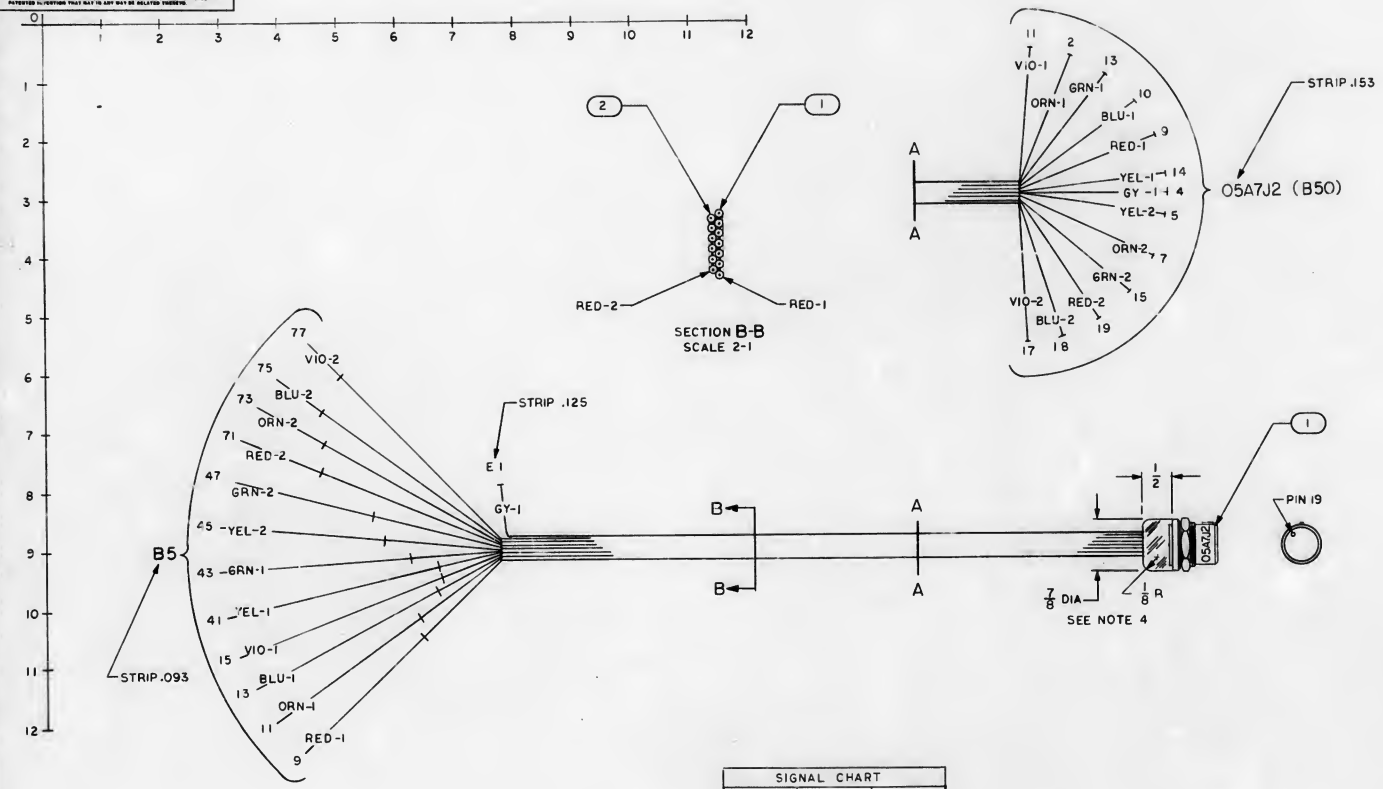
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLAT CABLE D
(TRAY B)

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1003743
SCALE 1/1
WT —
SHEET 1 OF 1

1003743

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



SIGNAL CHART		
05A7J2 CONN PIN NO.	COLOR	SIGNAL
B50-4	GY	CASGND
-10	BLU	+28BUF
-9	RED	
-2	ORN	
-11	VIO	
-7	ORN	+28AUF
-17	VIO	
-18	BLU	
-19	RED	
-13	GRN	OVDCUF
-14	YEL	
-15	GRN	
B50-5	YEL	

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TESTS SEE ND 1002032
3. IDENTIFY PER ND 1002019
4. ENCAPSULATE INDICATED AREA PER ND 1002036
5. * DENOTES LENGTH IN INCHES

QTY REQD	ART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
* 18	1006292-1	WIRE, ELECTRICAL, (FLAT CABLE)	3
* 18	1006292-2	WIRE, ELECTRICAL, FLAT CABLE	2
1	1006302-113	CONNECTOR, RECEPTACLE	1

LIST OF MATERIALS

1003701		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.060 .000 ANGLES ± — DO NOT SCALE THIS DRAWING	
NEXT ASSY	USED ON	MATERIAL	
APPLICATION		HEAT TREATMENT	
		FINAL FINISH	

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. — CONTRACT —
DRAWN A. O. Lee DATE 10-26-64
CHECKED D. Knapp
APPROVAL
APPROVAL Peter C. Hall 26 OCT 64
NASA APPROVAL W. J. Rhea 10-27-64
MIT APPROVAL

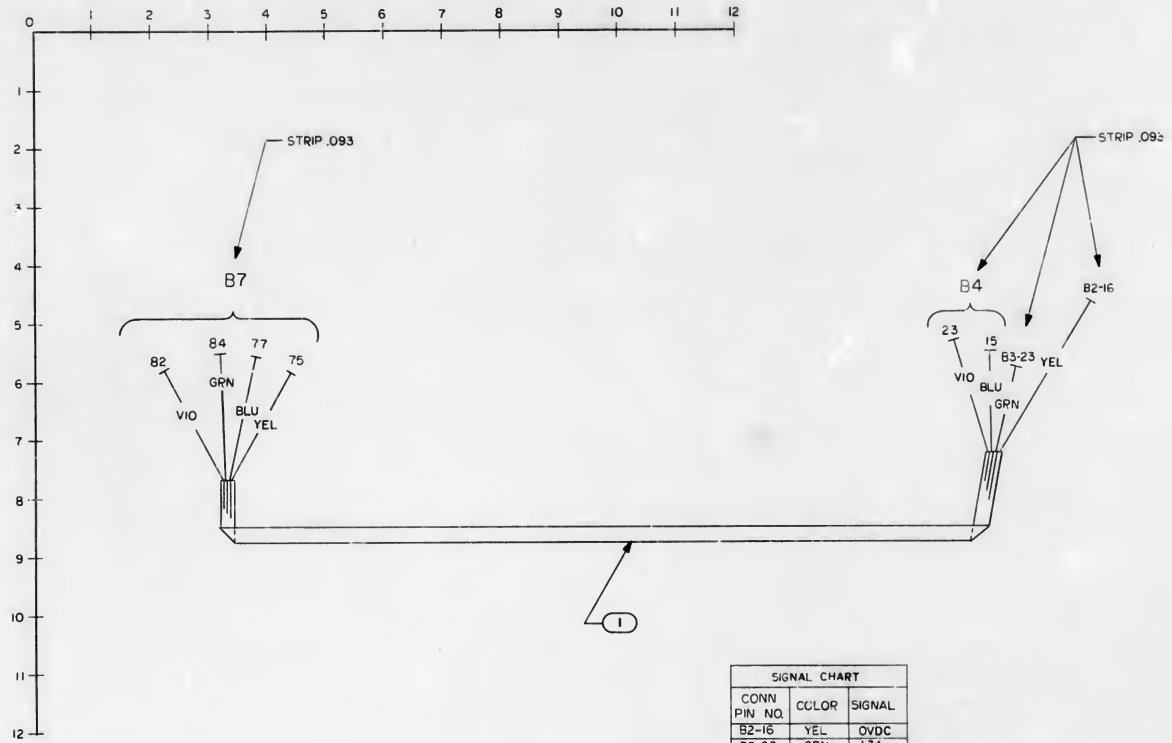
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR & HARNESS ASSY (TRAY B)

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1003744
SCALE 1/1
WT —
SHEET 1 OF 1

1003744

REVISIONS (SP 27)			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 14654 DR DO Clement CHK CW om	12 Feb 69	



SIGNAL CHART		
CONN PIN NO.	COLOR	SIGNAL
B2-16	YEL	0VDC
B3-23	GRN	+3A
B4-15	BLU	0VDC
B4-23	VIO	+3A

NOTES:
1. INTEPPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR SYMBOLS FABRICATION AND REQUIRED TEST SEE ND 1002032
3. AR DENOTES AS REQUIRED
4. IDENTIFY PER ND 1002019

AR	1006292-1	WIRE, ELECTRICAL (FLAT CABLE)	1
QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FINO NO

LIST OF MATERIALS

NEXT ASSY	USED ON	APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS XXX ±.060 .000 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

M I T INSTRUMENTATION LAB CAMBRIDGE MASS
DRG. NO. CONTRACT

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

DRAWN P Feeley DATE 12/2/68
CHECKED Lu Lee 2 DEC 68
APPROVAL
APPROVAL Fred C Hall 12 Dec 68

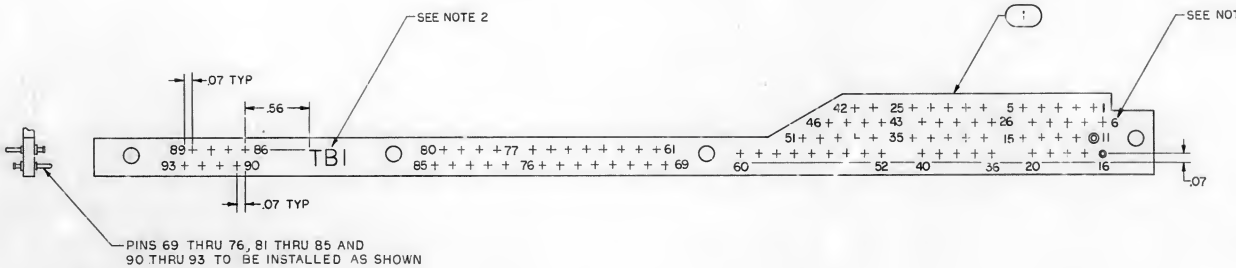
FLAT CABLE F
(TRAY B)

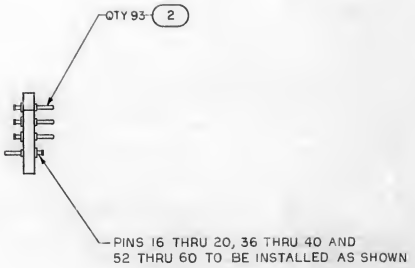
NASA APPROVAL W J Kincaid 10-27-69
MIT APPROVAL

CODE IDENT NO.	SIZE	NASA DRAWING NO
———	D	1003745
SCALE 1/1	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 3258	12-765	

1003756 A





NOTES
1. MARK BOTH SIDES .083 HIGH WHITE PER ND1002019 AND ND 1002122, TYPE II, CLASS I USING MARKING INK 1006271-1
2. MARK BOTH SIDES .125 HIGH WHITE PER ND1002019 AND ND 1002122, TYPE II, CLASS I USING MARKING INK 1006271-1
3. SWAGE FIND NO. 2 TO FIND NO. 1
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
93	1006297-003	TERMINAL, FEEDTHRU	2
1	1004755	BOARD, TERMINAL	1

LIST OF MATERIALS

	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ±.03 ANGLES ±
	DO NOT SCALE THIS DRAWING
	MATERIAL
1003758	HEAT TREATMENT
NEXT ASSY / USED ON	FINAL FINISH
APPLICATION	

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. / CONTRACT
DRAWN [illegible] DATE 2 AUG 64
CHECKED [illegible]
APPROVAL [illegible] Sept 15 64
APPROVAL [illegible] 22 Sept 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL BOARD ASSY (TBI)
AGC DSKY, NAV
100 SERIES

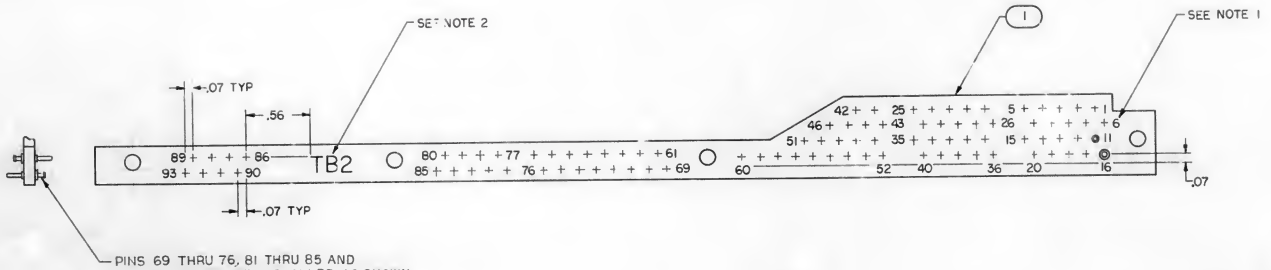
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL [illegible]

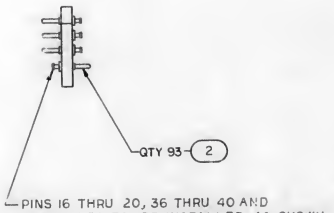
CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1003756
SCALE 2/1
WT
SHEET 1 OF 1

1003756

1003757 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13258	12/65	





NOTES
1. MARK BOTH SIDES .083 HIGH WHITE PER ND1002019 AND ND 1002122, TYPE II, CLASS I USING MARKING INK 1006271-1
2. MARK BOTH SIDES .125 HIGH WHITE PER ND1002019 AND ND 1002122, TYPE II, CLASS I USING MARKING INK 1006271-1
3. SWAGE FIND NO.2 TO FIND NO.1
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
93	1006297-003	TERMINAL, FEEDTHRU	2
1	1004755	BOARD, TERMINAL	1

LIST OF MATERIALS

1003758	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DEPT. NO. CONTRACT

DRAWN DATE 3/4/64
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 4-22-64
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL BOARD ASSY (TB2)
AGC DSKY, NAV
100 SERIES

CODE IDENT NO. —— SIZE D NASA DRAWING NO. 1003757
SCALE 2/1 WT SHEET 1 OF 1

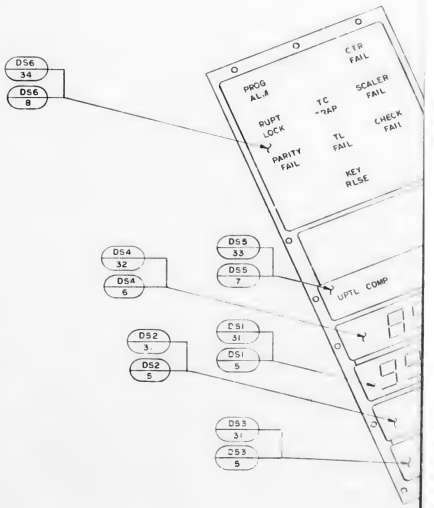
1003757 A

LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS3	N3	TB1-16
	F3	-17
	E3	-18
	E4	-19
	N2	-11
	J3	-12
	H3	-13
	F2	-14
	E2	-15
	N1	-6
	K1	-7
	M2	-8
	J2	-9
	N2	-10
	W1	-1
	J1	-2
	F1	-3
	H1	-4
	E1	TB1-5
	K2	TB2-16
	K3	-17
	M3	-18
	G1	-20
	N4	-11
	M4	-12
	J4	-13
	F4	-14
	H4	-15
	N5	-6
	M5	-7
	K4	-8
	H5	-9
	E5	-10
	B1	-1
	A1	-2
	K5	-3
	J5	-4
	F5	TB2-5
DS2	N3	TB1-36
	F3	-37
	E3	-38
	E4	-39
	N2	-31
	J3	-32
	H3	-33
	F2	-34
	E2	-35
	N1	-25
	K1	-27
	M2	-28
	J2	-29
	H2	-30
	M1	-21
	J1	-22
	F1	-23
	H1	-24
	E1	TB1-25
	K2	TB2-36
	K3	-37
	M3	-38
	G1	-40
	N4	-31
	M4	-32
	J4	-33
	F4	-34
	H4	-35
	N5	-26
	M5	-27
	K4	-28
	H5	-29
	E5	-30
	B1	-21
	A1	-22
	K5	-23
	J5	-24
	F5	TB2-25

LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS1	N3	TB1-52
	J2	-53
	J3	-54
	F2	-55
	H3	-56
	F3	-57
	E3	-58
	E4	-59
	N2	-47
	K1	-48
	M2	-49
	H2	-50
	E2	-51
	N1	-43
	J1	-44
	F1	-45
	E1	-46
	J1	-41
	N1	TB1-42
	K2	TB2-52
	M3	-53
	K3	-54
	M4	-55
	J4	-56
	H4	-57
	F4	-58
	G1	-60
	N4	-47
	M5	-48
	K4	-49
	H5	-50
	E5	-51
	N5	-43
	K5	-44
	J5	-45
	F5	-46
	B1	-41
	A1	TB2-42
DS4	K2	TB1-70
	M2	-71
	J2	-72
	F2	-73
	H2	-74
	E2	-75
	N2	-61
	N1	-62
	K1	-63
	M1	-64
	J1	-65
	F1	-66
	H1	-67
	E1	TB1-68
	K3	TB2-70
	M3	-71
	J3	-72
	F3	-73
	H3	-74
	E3	-75
	N3	-61
	N4	-62
	K4	-63
	M4	-64
	J4	-65
	F4	-66
	H4	-67
	E4	TB2-68
	E6	TB1-69

LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS5	K1	TB1-82
	J1	-83
	F1	-84
	E1	-85
	N2	-77
	N1	-78
	M1	-79
	H1	TB1-80
	G1	TB2-81
	K2	-82
	J2	-83
	F2	-84
	E2	-85
	S1	-77
	S2	-78
	M2	-79
	N2	TB2-80
DS6	S3	TB1 90
	S11	-91
	S5	-92
	S4	-93
	S6	-86
	S7	-88
	S1	TB1-89
	S10A	TB2-90
	S9	-92
	S2	-93
	S5	-86
	S12	-88
	S8	TB2-89

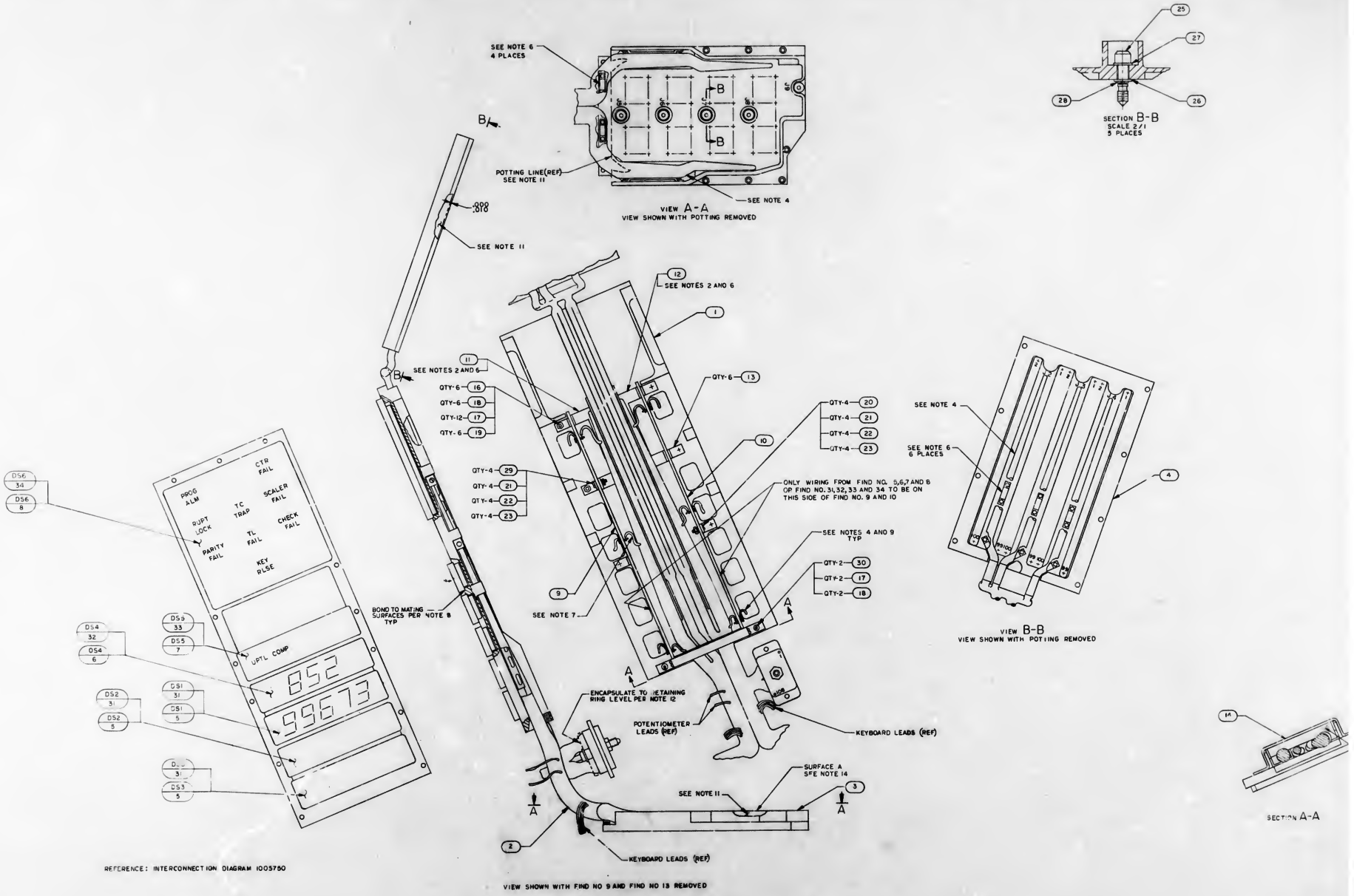
COLOR CODE TYP DS1 THRU DS6		
LEAD IDENT	TRACER	BASIC
A1	RED	YEL
B1	BLK	YEL
G1	—	BLK
G5		BLK
E1	—	WHT
F1	RED	
H1	ORN	
J1	GRN	
K1	BLU	
M1	BRN	
N1	VIO	WHT
E2	WHT	RED
F2	—	
H2	ORN	
J2	GRN	
K2	BLU	
M2	BRN	
N2	VIO	RED
E3	WHT	ORN
F3	RED	
H3	—	
J3	GRN	
K3	BLU	
M3	BRN	
N3	VIO	ORN
E4	WHT	GRN
F4	RED	
H4	ORN	
J4	—	
K4	BLU	
M4	BRN	
N4	VIO	GRN
E5	WHT	BLU
F5	RED	
H5	ORN	
J5	GRN	
K5	—	
M5	BRN	
N5	VIO	BLU
S1	—	YEL
S2	GRN	YEL
S4	YEL	BLK
S5	ORN	YEL
S7	YEL	RED
S8	BLU	YEL
S9	VIO	YEL
S11	BRN	YEL
S12	GRY	YEL
S3	YELLOW SLEEVE	
S10	RED SLEEVE	
S6	BLK SLEEVE	
E6	—	BLK



REFERENCE: INTERCONNECTION DIAGRAM 1005750

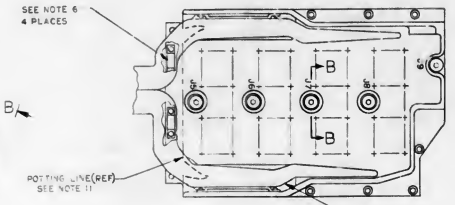
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. BEND FIND NO. 1 AND 12 TO FIND NO. 1 IN ASSEMBLED POSITION PER ND1002004, TYPE II
3. BEND FIND NO.15 TO FIND NO.14 AS SHOWN PER MIL-A-5092, TYPE II
4. SOLDER FIND NO.2 TO FIND NO.3 AND 4 AND FIND NO. 5,6,7 AND 8 OR FIND NO. 31,32,33 AND 34 TO FIND NO.5 AND 10 PER ND1002071 USING SOLDER PER ND1002075
5. WIRE PER ND1002032
6. LACE HARNESS TO RETAINING STRAPS AND BRACKETS IN APPROXIMATE POSITION SHOWN USING FIND NO.24 AS REQUIRED
7. SOLDER FIND NO.2 TO FIND NO.9 AND 10 AS SHOWN PER ND-002071 EXCEPT SOLDER MATERIAL TO BE Sn5 PER QQ-S-571
8. BEND FIND NO.5,6,7 AND 8 OR FIND NO. 3,32,33 AND 34 TO FIND NO.1 PER ND1002004, TYPE II
9. DRESS AND TRIM AT ASSEMBLY. STRIP ALL LEADS .29 AND TIN
10. TYPICAL FIND NO.5,6,7 AND 8 OR FIND NO. 3,32,33 AND 34
11. AR DENOTES AS REQUIRED
12. ENCAPSULATE PER ND-00227
13. ENCAPSULATE INDICATED AREA PER ND1002039, METHOD E, WITH PRIMER
14. THE TERMINAL CONFIGURATION IS IDENTIFIED BY THE DRAWING NUMBER AND A-200 SUFFIX
15. POTTING TO BE .005 BELOW TO .010 ABOVE SURFACE A

1003758 C

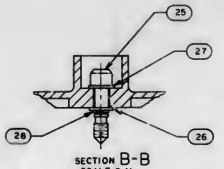

SEE NOTE 6
4 PLACES
POTTING LINE(REF)
SEE NOTE 11
SEE NOTE 4
VIEW A-A
VIEW SHOWN WITH POTTING REMOVED
SEE NOTE 11
SEE NOTES 2 AND 6
SEE NOTES 2 AND 6
QTY-6 16
QTY-6 18
QTY-12 17
QTY-6 19
QTY-6 13
QTY-4 20
QTY-4 21
QTY-4 22
QTY-4 23
QTY-4 29
QTY-4 21
QTY-4 22
QTY-4 23
ONLY WIRING FROM FIND NO. 5,6,7 AND 8 OF FIND NO. 31,32,33 AND 34 TO BE ON THIS SIDE OF FIND NO. 9 AND 10
SEE NOTES 4 AND 9 TYP
QTY-2 30
QTY-2 17
QTY-2 18
SEE NOTE 7
BOND TO MATING SURFACES PER NOTE 8 TYP
ENCAPSULATE TO RETAINING RING LEVEL PER NOTE 12
POTENTIOMETER LEADS (REF)
KEYBOARD LEADS (REF)
SURFACE A SEE NOTE 14
SEE NOTE 11
KEYBOARD LEADS (REF)
VIEW SHOWN WITH FIND NO 9 AND FIND NO 13 REMOVED
PROG ALM
CTR FAIL
TC TRAP
SCALER FAIL
RUPT LOCK
CHECK FAIL
TL FAIL
PARITY FAIL
KEY RLSE
UPTL COMP
852
99673
REFERENCE: INTERCONNECTION DIAGRAM 1005750
SEE NOTE 4
SEE NOTE 6
6 PLACES
VIEW B-B
VIEW SHOWN WITH POTTING REMOVED
SECTION B-B
SCALE 2/1
5 PLACES
SECTION A-A

1003758 C

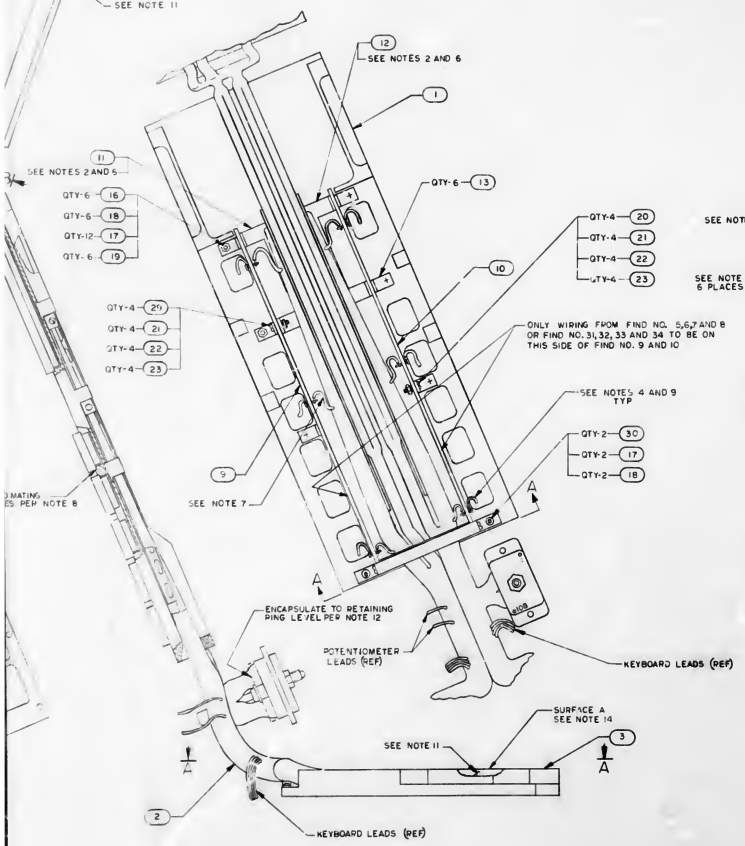
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGES PER TDRR 20556		
C	REVISED PER TDRR 24219 DR E Williams CHK [illegible] APPD	[illegible]	[illegible]



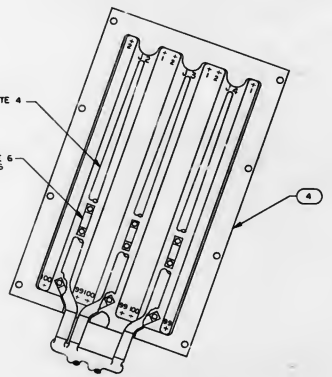
VIEW A-A
VIEW SHOWN WITH POTTING REMOVED



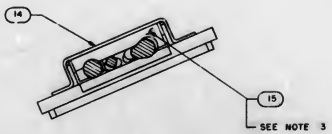
SECTION B-B
SCALE 2/1
5 PLACES



VIEW SHOWN WITH FIND NO 9 AND FIND NO 13 REMOVED



VIEW B-B
VIEW SHOWN WITH POTTING REMOVED



SECTION A-A

(B) REPLACES REV A WITH CHANGES

1		1003800-011	INDICATOR, E/L ASSY (ALARM)	34
1		1003801-011	INDICATOR, E/L ASSY (PROG)	33
1		1003802-011	INDICATOR, E/L ASSY (V-N)	32
3		1003803-011	INDICATOR, E/L ASSY (REG)	31
2	2	MS16995-9	SCREW, CAP	30
4	4	MS35233-5	SCREW, PAN HD	29
5	5	MS16633-4015	RING, RETAINING	28
5	5	1004546-1	WASHER, FLAT	27
5	5	1004546-3	WASHER, FLAT	26
5	5	1004579-1	SCREW, JACKING	25
AR	AR	1012307-003	TAPE, LACING	24
8	8	NAS671C2	NUT, HEX, PLAIN	23
8	8	MS35337-77	WASHER, LOCK	22
8	8	NAS620C2	WASHER, FLAT	21
4	4	MS35233-4	SCREW, PAN, HD	20
6	6	NAS671C4	NUT, HEX, PLAIN	19
8	8	MS35337-78	WASHER, LOCK	18
14	14	NAS620C4	WASHER, FLAT	17
6	6	MS16995-10	SCREW, CAP	16
	1	1004758	CUSHION, CABLE	15
1	1	1004757	BRACKET, CABLE	14
6	6	1004756	BRACKET	13
1	1	1004854	BRACKET, CABLE, RH	12
1	1	1004853	BRACKET, CABLE, LH	11
1	1	1003757	TERMINAL BOARD ASSY (TB2)	10
1	1	1003756	TERMINAL BOARD ASSY (TB1)	9
	1	1003800-000	INDICATOR, E/L ASSY (ALARM)	8
	1	1003801-000	INDICATOR, E/L ASSY (PROG)	7
	1	1003802-000	INDICATOR, E/L ASSY (V-N)	5
	3	1003803-000	INDICATOR, E/L ASSY (REG)	6
1	1	1003531-011	PLATE, WIRE WRAP ASSY (DECODING)	4
1	1	1003822-011	PLATE, WIRE WRAP ASSY (RELAY)	3
1	1	1003825-011	WIRING HARNESS, BRANCHED	2
1	1	1004751	E/L FRAME	1
QTY PER ASSY	QTY	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

011 000 LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON DECIMALS .XX ± .03 .XXX ±	NEXT ASSY 1003706 USED ON APPLICATION
		DO NOT SCALE DRAWING MATERIAL	

NTV INSTRUMENTATION LAB CHARGE NO.
DRAWN Mason Moore DATE 11-4-68
APPROVED Paul Lange
APPROVED [illegible]
APPROVED [illegible]
APPROVED [illegible]
NIT APPROVED [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

E/L FRAME & HARNESS ASSY
AGC DSKY NAV
100 SERIES

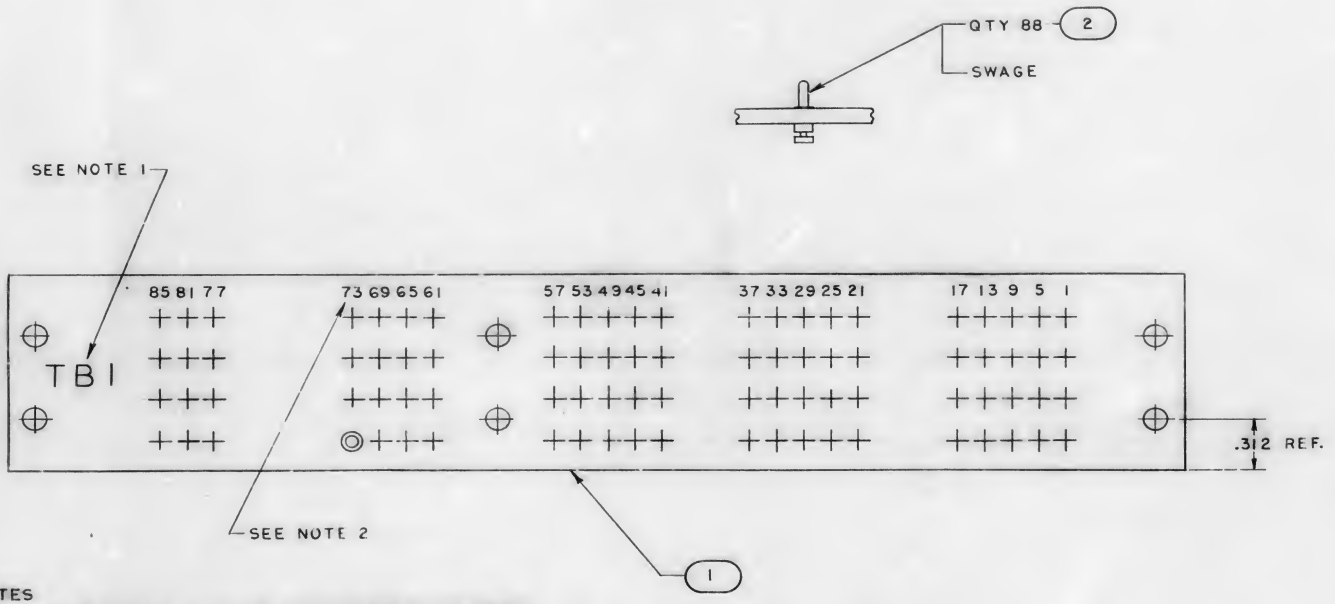
COST CENTER NO. 80230 | UNIT J | DRAWING NO. 1003758
SCALE 1/1 | WT | SHEET 1 OF 1

1003758 C

1003758

1003759 –

REVISIONS 13222			
SYM	DESCRIPTION	DATE	APPROVAL



NOTES

1. MARK BOTH SIDES .125 HIGH WHITE CHARACTERS PER ND1002019 AND 1002122 TYPE II, CLASS I, USING MARKING INK PER 1006271-1 LOCATE APPROX. WHERE SHOWN
2. MARK BOTH SIDES .083 HIGH WHITE CHARACTERS PER ND1002019 AND 1002122 TYPE II, CLASS I, USING MARKING INK PER 1006271-1 LOCATE APPROX WHERE SHOWN
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
88	1006297	TERMINAL, STUD	2
1	1004803	BOARD, TERMINAL	1

LIST OF MATERIALS

1003809	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Boudreau DATE 20 Aug 64
CHECKED R. Logue 10 Sept 64
APPROVAL Vogensen 9/22/64
APPROVAL Stan Cahill 6 Oct 64
NASA APPROVAL W J Rhine NOV-6-64
MIT APPROVAL
MIT APPROVAL W T Cogdell 6 Oct 64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

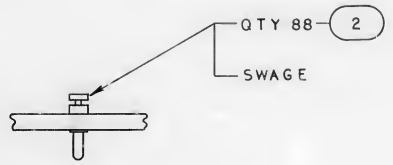
TERMINAL BOARD ASSY TBI
AGC DSKY MAIN 100 SERIES

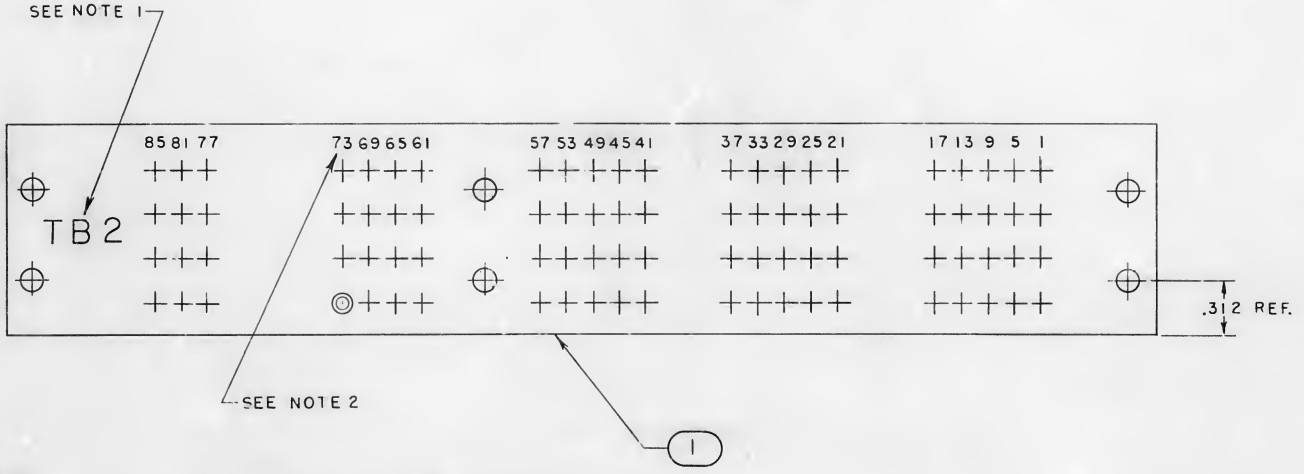
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1003759
SCALE 2/1	WT	SHEET 1 OF 1

1003759 B

–	1003760

REVISIONS 13222			
BY	DESCRIPTION	DATE	APPROVAL





NOTES

1. MARK BOTH SIDES .125 HIGH WHITE PER ND1002019 AND 1002122 TYPE II, CLASS I, USING MARKING INK PER 1006271-1 LOCATE APPROX. WHERE SHOWN
2. MARK BOTH SIDES .083 HIGH WHITE PER ND1002019 AND 1002122 TYPE II, CLASS I, USING MARKING INK PER 1006271-1 LOCATE APPROX WHERE SHOWN
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
88	1006297	TERMINAL, STUD	2
1	1004803	BOARD, TERMINAL	1

LIST OF MATERIALS

1003809	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN B. Boudreau DATE 29 Aug 64
CHECKED R. Leger 15 Sept 64
APPROVAL A. Jensen 9/22/64
APPROVAL
NASA APPROVAL W. J. Rhine 10-6-64
MIT APPROVAL
MIT APPROVAL W. Hoffman

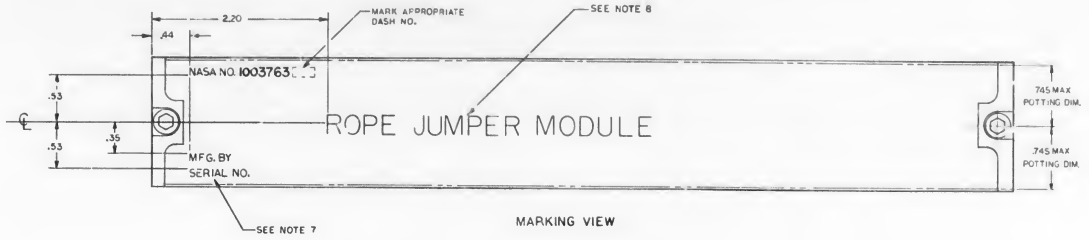
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL BOARD ASSY TB2
AGC DSKY MAIN 100 SERIES

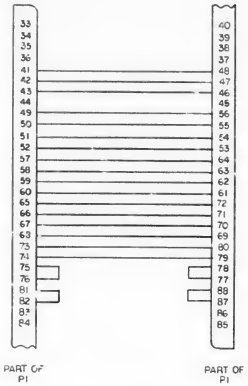
CODE IDENT NO.	SIZE	NASA DRAWING NO.
———	C	1003760
SCALE 2/1	WT	SHEET 1 OF 1

1003760

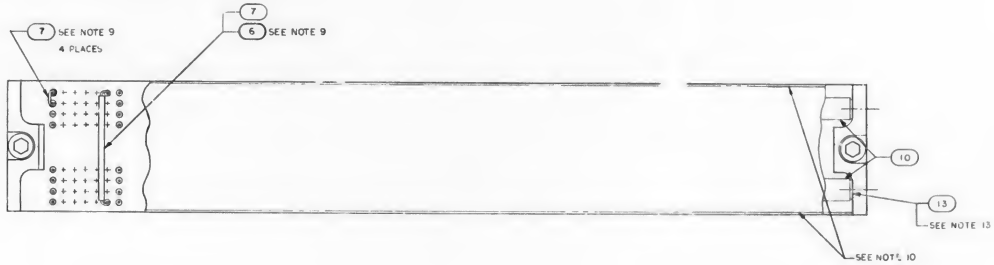
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TORN 15647 DR. CHK. APPD.		
B	REVISED PER TORN 16706 DR. CHK. APPD.		

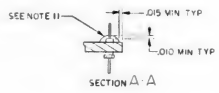


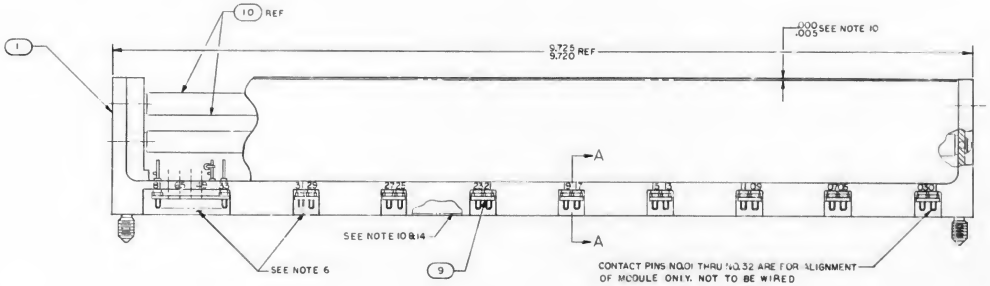
MARKING VIEW

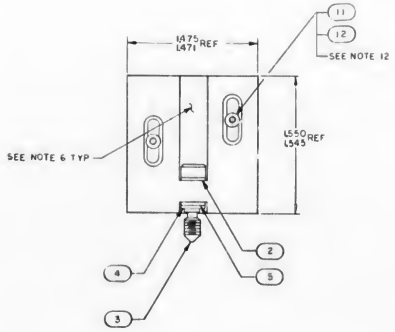


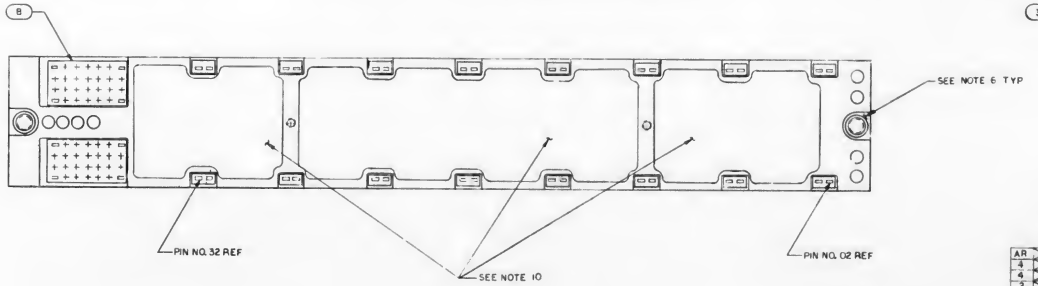
WIRING DIAGRAM











NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. WIRE PER ND1002029
3. ALL SOLDERING CONNECTIONS TO BE MADE PER ND1002071
4. QQ-W-343, TYPE S, 24 AWG AND TINNED
5. AR DENOTES AS REQUIRED
6. INDICATED AREAS TO BE FREE OF ENCAPSULATING COMPOUND
7. MARK $\frac{09}{10}$ HIGH PER ND1002019 f 1002122, TYPE II, CLASS I USING WHITE MARKING INK 1006271-1 SERIALIZE PER ND1002023
8. MARK $\frac{24}{26}$ HIGH PER ND1002019 f 1002122, TYPE II, CLASS I USING WHITE MARKING INK 1006271-1
9. WIRE PER WIRING DIAGRAM
10. ENCAPSULATE MODULE PER ND1002002 (POLYURETHANE FOAM) INDICATED AREAS ONLY
11. SEAL TERMINALS f INSULATORS TO FIND NO.1 USING 1011541
12. ASSEMBLE FIND NO.11 TO FIND NO.10 USING MIL-S-22473B, GRADE HV
13. USE PART OF FIND NO.12 TO ELIMINATE SPACE BETWEEN FIND NO.11 AND FIND NO.6 BOTH ENDS
14. ENCAPSULATING MATERIAL TO BE .005 BELOW FLUSH TO .005 ABOVE FLUSH WHERE INDICATED

QTY REQD	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
AR	AR	1004623-2	SHIM	13
4	4	1004237	WASHER, FLAT	12
4	4	1006783-11	SCRT, BUTTON HEAD	11
2	2	1004833	ROD, REINFORCING	10
16	16	1004727	GASKET ROPE MODULE	9
2	2	1004726	GASKET ROPE MODULE	8
AR	AR	SEE NOTE 4	WIRE, ELECTRICAL	7
AR	AR	1006176-22	INSULATION, SLEEVING	6
2	2	1004546-3	WASHER, FLAT	5
2	2	MS16633-4015	RING, RETAINING, EXTERNAL "E"	4
2	2	1004573-1	SCREW, JACKING	3
2	2	1004546-1	WASHER, FLAT	2
1	1	1003135	HEADER ASSEMBLY	1

-021-011

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
.X = ±.02 .XX = ±.01
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY USED ON APPLICATION

M.I.T. INSTRUMENTATION LAB CAMBRIDGE MASS.
DRAWN DATE 9-14-67
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL 11-4-67
MIT APPROVAL

MANNED SPACECRAFT CENTER HOUSTON TEXAS

ROPE JUMPER MODULE ASSEMBLY

CODE IDENT NO | SIZE E | NASA DRAWING NO 1003763
SCALE 2/1 WT SHEET 1 OF 1

1003777

REVISIONS 17565						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED

DESCRIPTION	DWG. NO.
AGC ASSEMBLY	1003700
NAV. DSKY	1003706
MAIN DSKY	1003707
WIRING HARNESS	1005707

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED PER MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
			LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

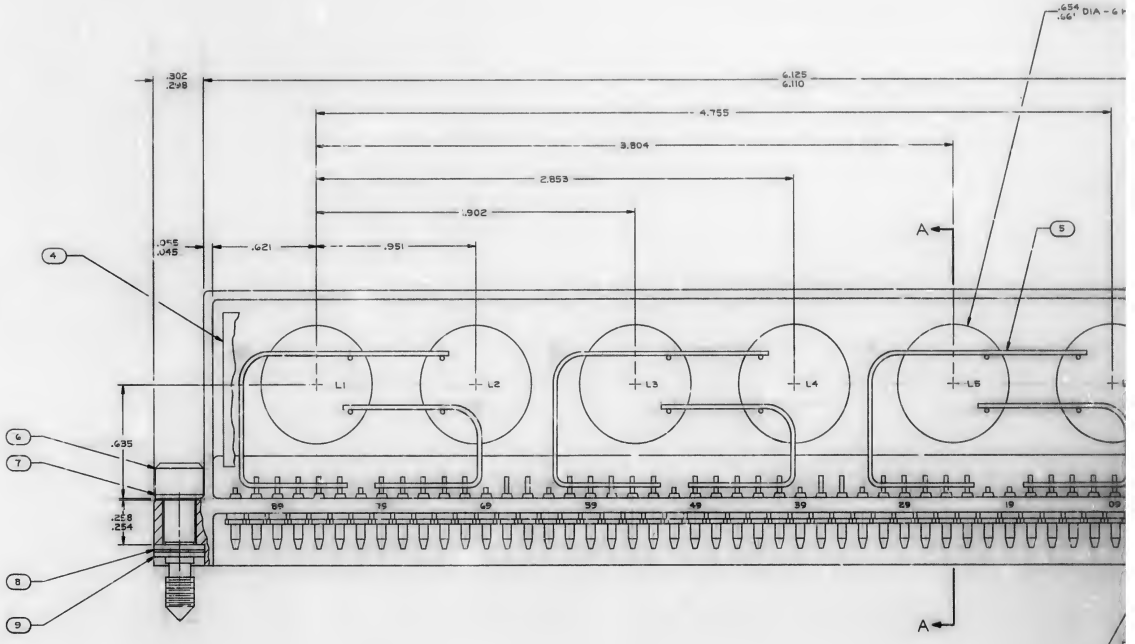
		DATE
DRAWN	Hansen	9/10/64
CHECKED		
APPROVED		
APPROVED	Eldon C Hall	9/14/64
APPROVED MIT	D Hoag	9/15/64
APPROVED MSC	K Mitchell	9/21/64

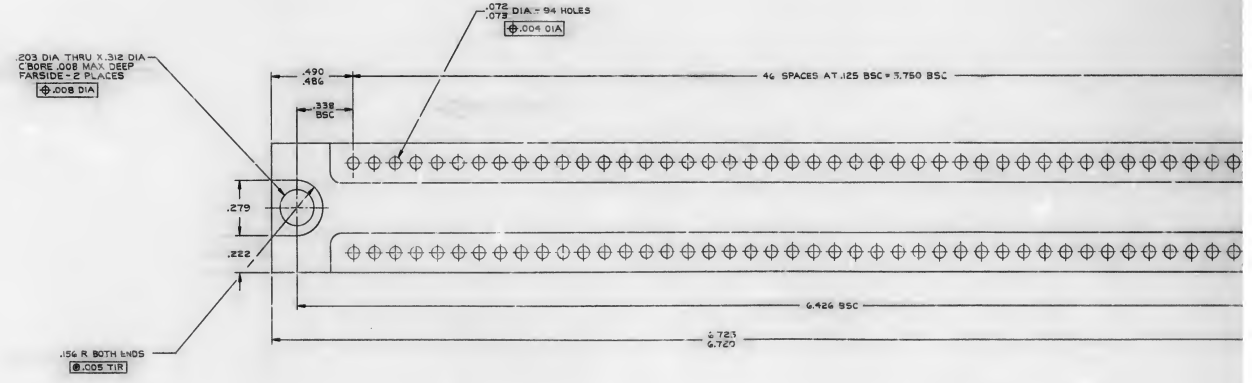
APOLLO GUIDANCE COMPUTER SUB SYSTEM

CODE IDENT NO.	SIZE	DRAWING NO.
	C	1003777

SCALE

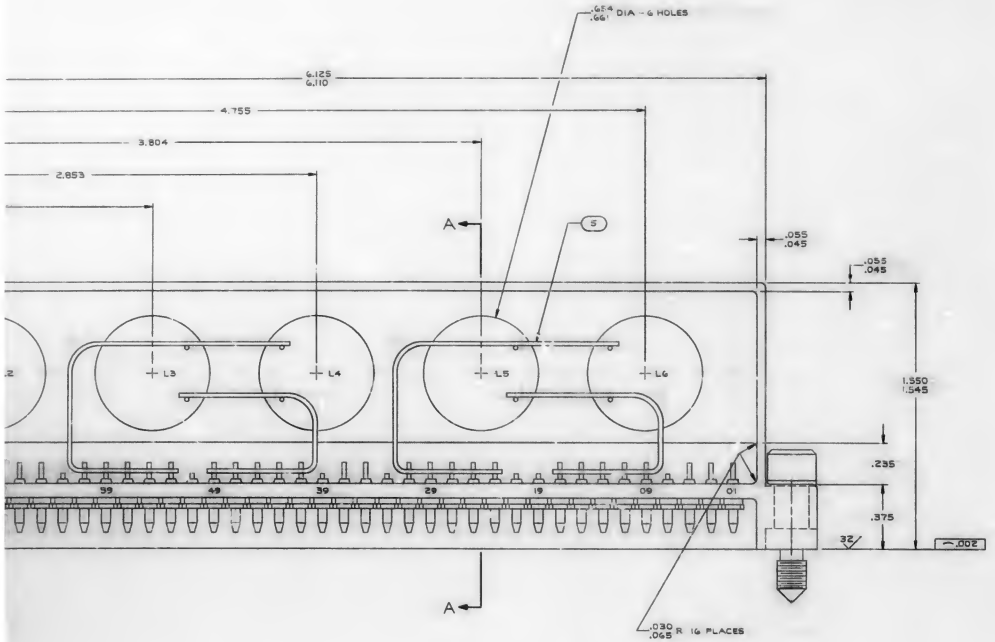
SHEET OF

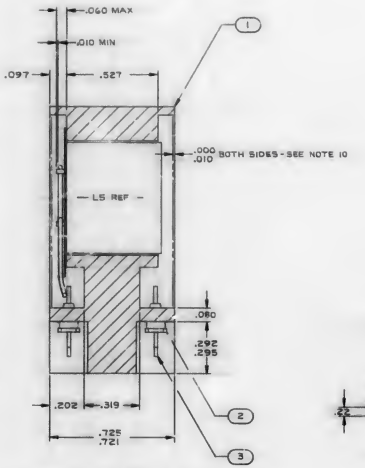




NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: MAGNESIUM ALLOY ZK-60A-T5 PER QQ-M-31A
3. UNLESS OTHERWISE SPECIFIED, ALL FILLETS AND RADII .005-.020
4. UNLESS OTHERWISE SPECIFIED .125 ALL OVER
5. REMOVE ALL BURRS AND BREAK SHARP EDGES .005-.020
6. FINISH: ANODIZE PER MIL-M-45202, TYPE I, CLASS C
7. AR DENOTES AS REQUIRED
8. WELD PER NO1002005
9. ASSEMBLE FIND NO. 2 TO FIND NO. 3 PER NO1002134
10. ENCAPSULATE PER NO1002002
11. STAKE PER NO1002009
12. MARK .060/.070 HIGH WHITE CHARACTERS PER NO1002019 AND NO1002122 TYPE II CLASS I
13. MARK .093 HIGH WHITE CHARACTERS PER NO1002019 AND NO1002122 TYPE II CLASS I
14. MARK .250 HIGH WHITE CHARACTERS PER NO1002019 AND NO1002122 TYPE II CLASS I

1003797

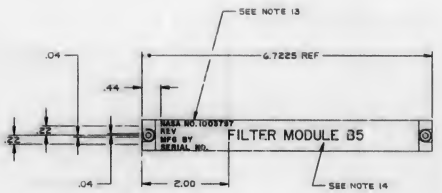




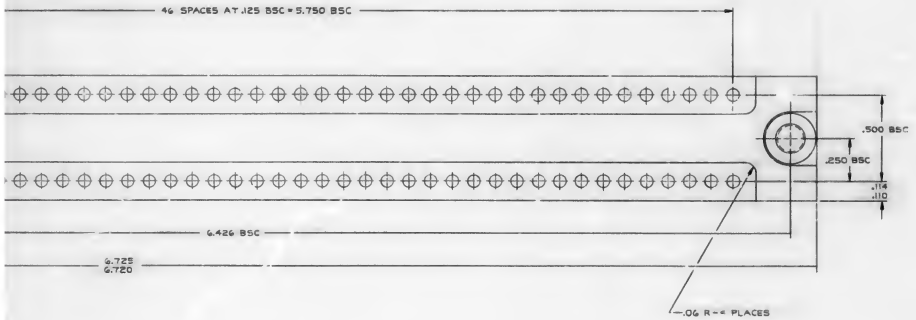
SECTION A-A

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 02721 DATE 6/5/67



MARKING VIEW
SCALE 1/1



QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
2	MS16633-4015	RING RETAINING EXTERNAL "E"	9
2	1004546-3	WASHER, FLAT	8
2	1004546-1	WASHER, FLAT	7
2	1004579-1	SCREW, JACKING	6
AR	1004787-23	WIRE, ELEC .025 DIA	5
1		INSULATOR	4
94	1004782-1	CONTACT, WRAPOST, MALE MIN	3
94	1026775	INSULATOR, WRAPOST, MALE MIN	2
1	1003797-1	HEADER HOUSING	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMAL ANGLES
.X ±.005 ±2
.XX ±.02
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT
FINISH
NEXT ASSY USED ON
APPLICATION

MIT INSTRUMENTATION LAB
Cambridge, Mass.
DRAWN
CHECKED
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DESIGN LAYOUT
FILTER MODULE

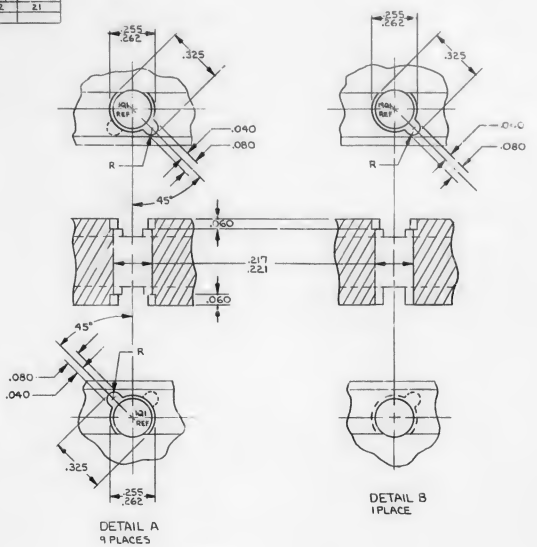
CODE IDENT NO. J
SIZE
NASA DRAWING NO. 1003797
SCALE 4/1
SHEET 1 OF 1

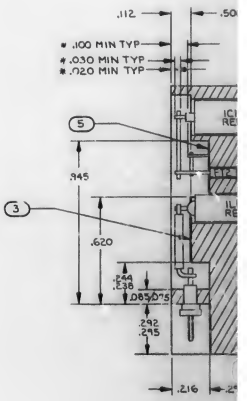
1003797

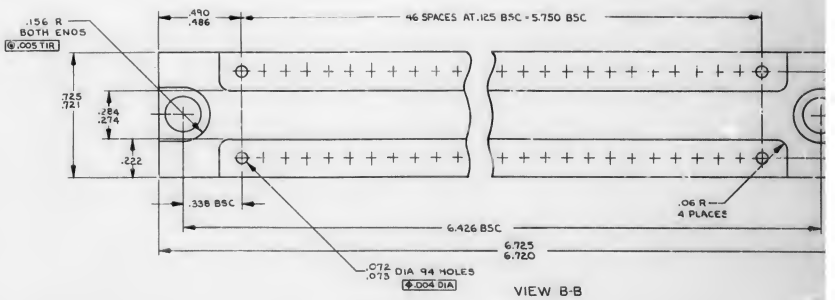
REF DES	"X"	"Y"	HOLE IDENT	PART NUMBER
1R1	-.405	.270	A	1006750-32
2R1	.405	.270		
3R1	-.360	.400		
4R1	.360	.400		
5R1	.795	.270		
6R1	1.605	.270		
7R1	.840	.400		
8R1	1.560	.400		
9R1	1.995	.270		
10R1	2.805	.270		
11R1	2.040	.400		
12R1	2.760	.400		
13R1	3.195	.270		
14R1	4.005	.270		
15R1	3.240	400		
16R1	3.960	.400		
17R1	4.395	.270		
18R1	4.440	.400		-32
19R1	5.160	.400		-32
1R2	-.530	.240		-8
2R2	.530	.240		
3R2	-.185	.185		
4R2	.185	.185		
5R2	.670	.240		
6R2	1.730	.240		
7R2	1.015	.185		
8R2	1.385	.185		
9R2	1.870	.240		
10R2	2.930	.240		
11R2	2.215	.185		
12R2	2.585	.185		
13R2	3.070	.240		
14R2	4.130	.240		
15R2	3.415	.185		
16R2	3.785	.185		
17R2	4.270	.240		
18R2	4.615	.185		
19R2	4.985	.185		
1R3	-.530	.370		
2R3	.530	.370		
3R3	-.135	.330		
4R3	.135	.330		
5R3	.670	.370		
6R3	1.730	.370		
7R3	1.065	.330		
8R3	1.335	.330		
9R3	1.870	.370		
10R3	1.930	.370		
11R3	2.265	.330		
12R3	2.535	.330		
13R3	3.070	.370		
14R3	3.130	.370		
15R3	3.465	.330		
16R3	3.735	.330		
17R3	4.270	.370		
18R3	4.665	.330		
19R3	4.935	.330		-8
1R4	-.120	-.140		-63
2R4	.090			
3R4	1.080			
4R4	1.370			
5R4	2.280			
6R4	2.490			
7R4	3.480			
8R4	3.690			
9R4	4.680			-63
10R4	4.890	-.140		-63
1R5	-.120	.000		-51
2R5	.120			
3R5	1.080			
4R5	1.320			
5R5	2.280			
6R5	2.520			
7R5	3.480			
8R5	3.720			
9R5	4.680			
10R5	4.920	.000		
1R6	1.185	-.070		
2R6	3.585	-.070		
3R6	5.330	.240	A	1006750-39
1L1	.000	.105	B	1010406-6
2L1	1.200	.105	B	
3L1	2.400	.105	B	
4L1	3.600	.105	B	
5L1	4.800	.105	B	1010406-6
1C1	.000	.620	C	1006755-79
2C1	1.200	.620	C	
3C1	2.400	.620	C	
4C1	3.600	.620	C	
5C1	4.800	.620	C	1006755-79

REF DES	"X"	"Y"	HOLE IDENT	PART NUMBER
1C2	-.180	.530	D	1006755-2
2C2	.180			
3C2	1.020			
4C2	1.380			
5C2	2.220			
6C2	2.580			
7C2	3.420			
8C2	3.780			
9C2	4.620			
10C2	4.980	.530	D	1006755-2
1CR1	-.280	.285	E	1006751
2CR1	.280	.285		
3CR1	-.240	.400		
4CR1	.240	.400		
5CR1	.920	.285		
6CR1	1.480	.285		
7CR1	.960	.400		
8CR1	1.440	.400		
9CR1	2.120	.285		
10CR1	2.680	.285		
11CR1	2.160	.400		
12CR1	2.640	.400		
13CR1	3.320	.285		
14CR1	3.880	.285		
15CR1	3.360	.400		
16CR1	3.840	.400		
17CR1	4.520	.285		
18CR1	4.560	.400		
19CR1	5.040	.400	E	1006751
1T1	-.385	.000	F	1006762
2T1	.385			
3T1	-.385			
4T1	.385			
5T1	.815			
6T1	1.585			
7T1	.815			
8T1	1.585			
9T1	2.015			
10T1	2.785			
11T1	2.015			
12T1	2.785			
13T1	3.215			
14T1	3.985			
15T1	3.215			
16T1	3.985			
17T1	4.415			
18T1	4.415			
19T1	5.185	.000	F	1006762
1Q1	-.450	.585	G	1003520-1
2Q1	.450			
3Q1	-.450			
4Q1	.450			
5Q1	.750			
6Q1	1.650			
7Q1	.750			
8Q1	1.650			
9Q1	1.950			
10Q1	2.850			
11Q1	1.950			
12Q1	2.850			
13Q1	3.150			
14Q1	4.050			
15Q1	3.150			
16Q1	4.050			
17Q1	4.350			
18Q1	4.350			
19Q1	5.250	.585	G	1003520-1
FT1	-.255	.635	H	FIND NO 9 & 11
FT2	.000	.305		
FT3	.195	-.160		
FT4	.255	.635		
FT5	.945	.635		
FT6	1.200	.305		
FT7	1.395	-.160		
FT8	1.455	.635		
FT9	2.145	.635		
FT10	2.400	.305		
FT11	2.598	-.160		
FT12	2.655	.635		
FT13	3.345	.635		
FT14	3.600	.305		
FT15	3.795	-.160		
FT16	3.855	.635		
FT17	4.545	.635		
FT18	4.800	.305		
FT19	4.995	-.160		
FT20	5.055	.635		
FT21	5.205	.210	H	FIND NO 9 & 10

HOLE IDENT		
LETTER	HOLE DIA	QTY
A	.100/.104	80
B	.168/.172	5
C	.203/.207	5
D	.152/.156	10
E	.081/.085	19
F	.382/.389	10
G	SEE DETAIL A&B	10
H	.058/.062	21

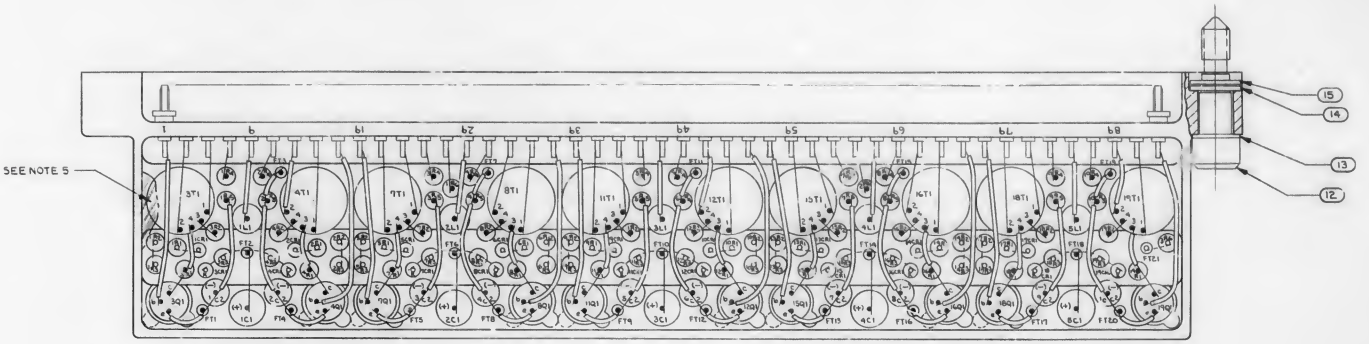


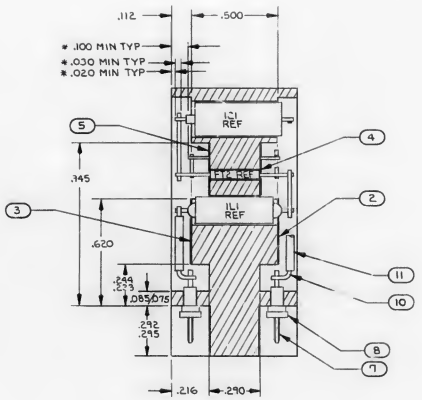


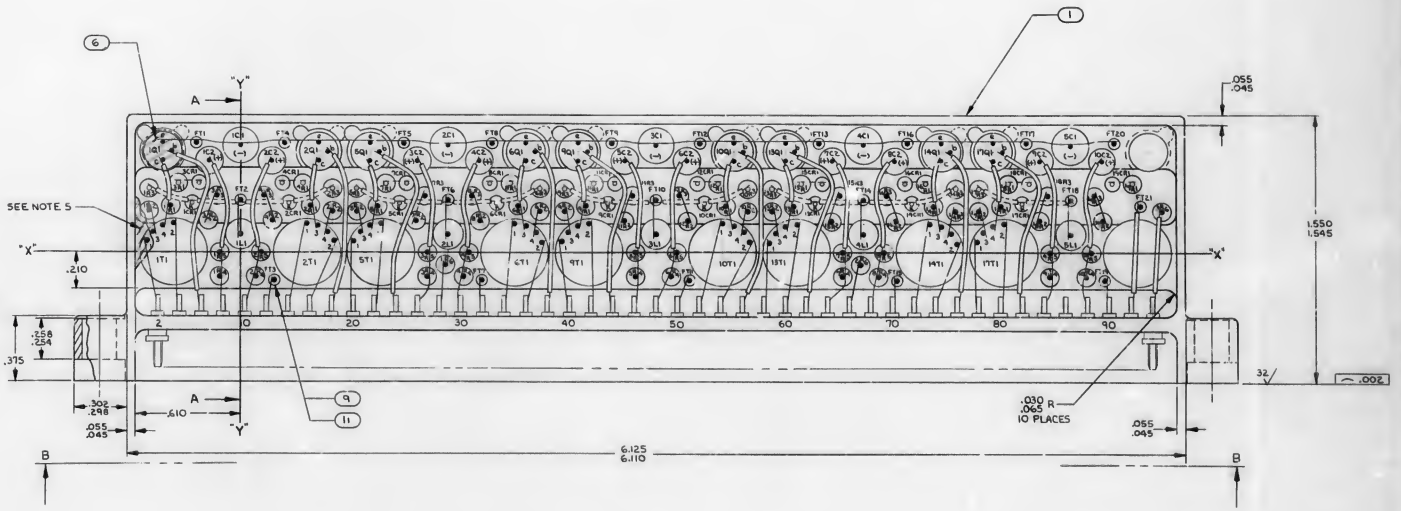


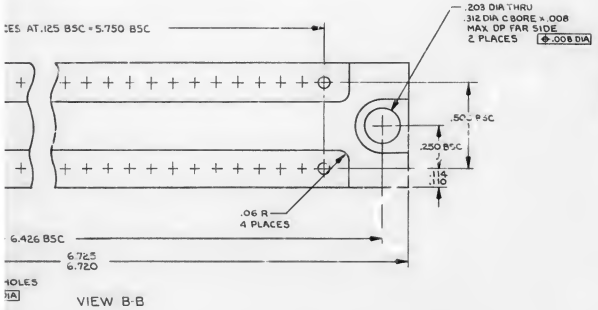
NOTES:
1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. NOTES FOR FIND NO. 1
   A. MATL: MAG ALLOY ZK60 A, TS PER QQ-M-31
   B. FINISH: ANODIZE PER MIL-M-45202 TYPE I CLASS C
   C. ALL SURFACES 125 UN LESS OTHERWISE SPECIFIED
   D. REMOVE BURRS & BREAK SHARP EDGES .005/.015
   E. ALL FILLETS & RADII TO BE .005/.020 UNLESS OTHERWISE SPECIFIED
3. ALL CONNECTIONS TO BE MADE BY WELDING PER ND 1002005 & ND 1002003
4. STAKE ALL RESISTORS, CAPACITORS, & TRANSFORMERS PER ND 1002009
5. ENCAPSULATE MODULE PER ND1002002 (BLACK POLYURETHANE FOAM)
6. MARK .093 HIGH WHITE CHARACTERS PER NO 1002122 TYPE II CLASS 1 PER NO 1002019 & SERIALIZE PER ND1002023
7. MARK .250 HIGH WHITE CHARACTERS PER ND 1002122 TYPE II CLASS 1 PER NO 1002019
8. o WHITE DOT & DOTTED LEADS INDICATE LOWER LEVEL WIRING
9. • BLACK DOT & SOLID LEADS INDICATE UPPER LEVEL WIRING
10. FT DENOTES FEED THRU
11. AR DENOTES AS REQUIRED
12. * DENOTES DIMS THAT DO NOT PERTAIN TO FIND NO. 1

1003798

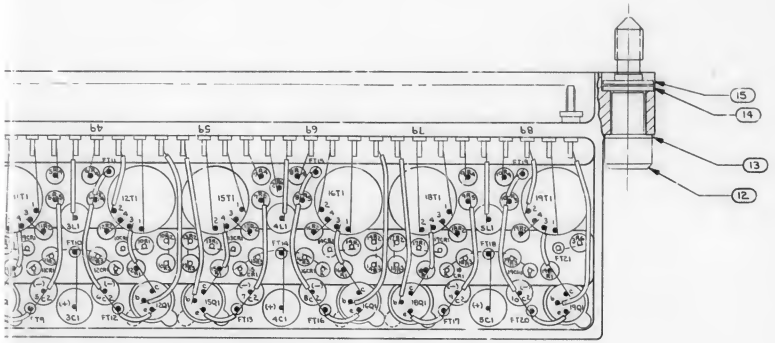

SEE NOTE 5
15
14
13
12

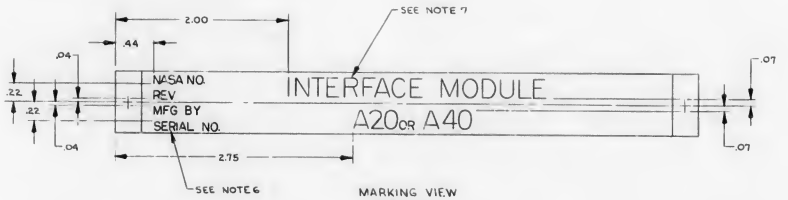

.112
.500
* .100 MIN TYP
* .030 MIN TYP
* .020 MIN TYP
5
4
3
2
11
10
8
7
.345
.620
.249
.223
.085
.075
.292
.245
.216
.290


6
1
A
"Y"
SEE NOTE 5
"X"
"X'
.210
.375
.558
.554
.302
.298
.610
.055
.045
9
11
.030 R
.065
10 PLACES
1.550
1.545
.002
6.125
6.110
B

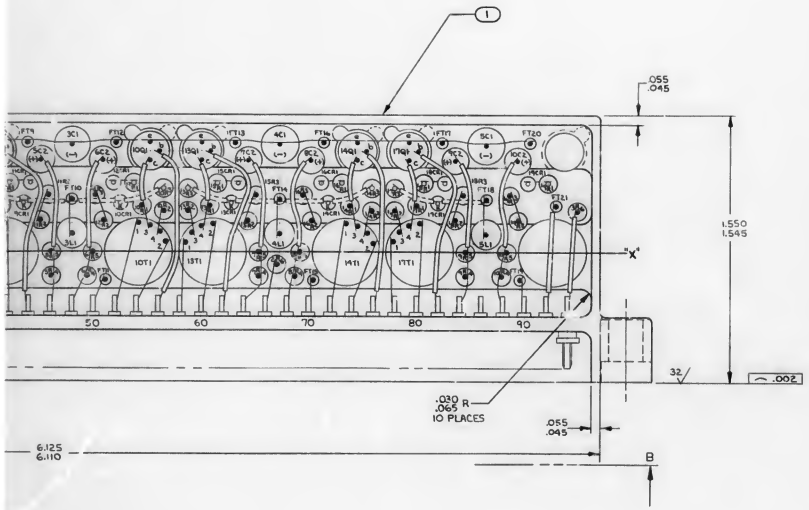

.203 DIA THRU
.312 DIA C BORE x .008
MAX DP FAR SIDE
2 PLACES
.008 DIA
.50 BSC
.250 BSC
.114
.110
.06 R
4 PLACES
6.426 BSC
6.725
6.720
VIEW B-B

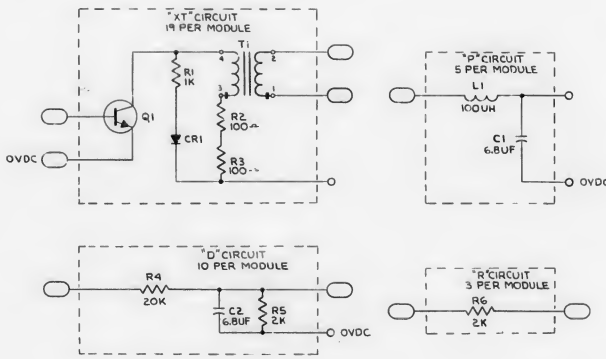
1003798





MARKING VIEW
SCALE 2/1





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 09792 DATE 6/6/67

REF	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
			SCHEMATIC	
				16
				15
				14
				13
				12
				11
				10
				9
				8
				7
				6
				5
				4
				3
				2
				1
2	2	MS16633-4015	RING, RETAINING	15
2	2	1004546-3	WASHER, FLAT	14
2	2	1004546-1	WASHER, FLAT	13
2	2	1004579-1	SCREW, JACKING	12
AR	AR	1006776-22	INSULATION, SLEEVING	11
AR	AR	1006757-1	WIRE, ELECTRICAL	10
AR	AR	1006757-8	WIRE, ELECTRICAL	9
94	94	1006775	INSULATOR, WRAPOST	8
94	94	1006782-1	CONTACT, WRAPOST	7
19	19		INSULATOR, TRANSISTOR	6
1	1		INSULATOR	5
1	1		INSULATOR	4
1	1		INSULATOR	3
1	1		INSULATOR	2
1	1		HEADER, HOUSING	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
.XX ± .01
.XXX ± .005
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE 2A
HEAT TREATMENT:
FINAL FINISH: SEE NOTE 2B

NEXT ASSY | USED ON | APPLICATION

ITT FEDERAL ENGINEERING LABORATORIES
NAME | SIGNATURE | DATE
DRAWN J. Brighton 6/5/67
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
ITT APPROVED

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

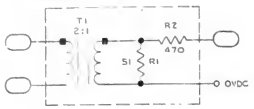
DESIGN LAYOUT
INTERFACE MODULE
A20-A40

CODE IDENT NO. | SIZE | NASA DRAWING NO.
1003798

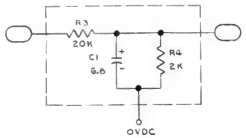
SCALE 4/1 | WT | SHEET 1 OF 1

1003798 A

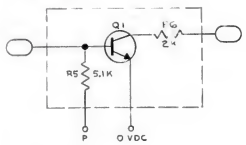
15 F CIRCUITS



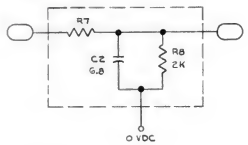
4 D CIRCUITS



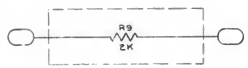
14 T CIRCUITS



5 S CIRCUITS



3 R CIRCUITS

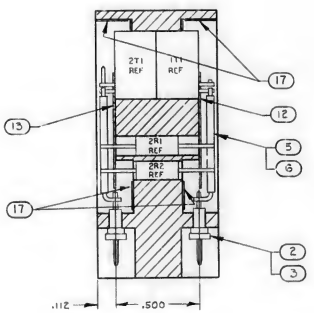


REF DES	X DIM	Y DIM	HOLE IDENT	PART NUMBER
1R1	.210	.136	A	1006750-1
2R1	.000			
3R1	.584			
4R1	.374			
5R1	.960			
6R1	.748			
7R1	1.335			
8R1	1.125			
9R1	1.710			
10R1	1.500			
11R1	2.085			
12R1	1.875			
13R1	2.460			
14R1	2.250	.136		
15R1	2.625	.000		1006750-1
1R2	.210			1006750-24
2R2	.000			
3R2	.384			
4R2	.374			
5R2	.960			
6R2	.748			
7R2	1.335			
8R2	1.125			
9R2	1.710			
10R2	1.500			
11R2	2.085			
12R2	1.875			
13R2	2.460			
14R2	2.250	.000		
15R2	2.625	.136		1006750-24
1R3	3.105	.136		1006750-63
2R3	3.105	.000		1006750-63
3R3	3.230			1006750-63
4R3	3.355			1006750-63
1R7	3.480			1006750-
2R7	3.605			
3R7	3.730			
5R7	3.855	.000		
6R7	3.792	.136		1006750-
1R6	3.105	.755		1006750-39
2R6	3.167	.640		
3R6	3.230	.755		
4R6	3.355			
1R3	3.480			
2R6	3.605			
3R6	3.730			
5R6	3.855	.755		
4R6	3.792	.640		1006750-39
1R5	4.217	.710		1006750-49
2R5	4.132	.785		
3R5	4.527	.710		
4R5	4.382	.785		
5R5	4.777	.710		
6R5	4.632	.785		
7R5	5.027	.710		
8R5	4.882	.785		
9R5	5.277	.710		
10R5	5.132	.785		
11R5	5.527	.710		
12R5	5.382	.785		
13R5	5.777	.710		
14R5	5.632	.785		1006750-49
1R9	4.229	.000		1006750-33
2R9	4.105			
3R9	4.479			
4R9	4.355			
5R9	4.729			
6R9	4.605			
7R9	4.979			
8R9	4.855			
9R9	5.229			
10R9	5.105			
11R9	5.479			
12R9	5.355			
13R9	5.729			
14R9	5.605	.000		
1R9	2.730	.710		
2R9	2.855	.710		
3R9	2.855	.000	A	1006750-39

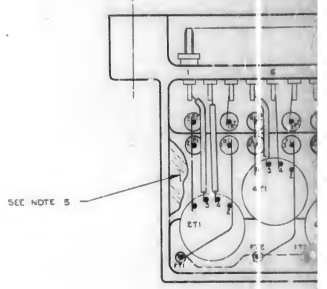
REF DES	X DIM	Y DIM	HOLE IDENT	PART NUMBER
1C1	3.120	.285	D	1006755-2
2C1	3.210	.460		
3C1	3.300	.285		
4 1	3.390	.460		
1C2	3.480	.285		
2C2	3.570	.460		
3C2	3.660	.285		
4C2	3.750	.460		
5C2	3.840	.285	B	1006755-2
1Q1	4.167	.200	C	1003520-1
2Q1	4.167	.200		
3Q1	4.617	.435		
4Q1	4.617	.435		
5Q1	4.667	.200		
6Q1	4.667	.200		
7Q1	4.917	.435		
8Q1	4.917	.435		
9Q1	5.167	.200		
10Q1	5.167	.200		
11Q1	5.417	.435		
12Q1	5.417	.435		
13Q1	5.667	.200		
14Q1	5.667	.200	C	1003520-1
1T1	.105	.610	D	1006762-2
2T1	.105	.610		
3T1	.480	.405		
4T1	.480	.405		
5T1	.855	.610		
6T1	.855	.610		
7T1	1.230	.405		
8T1	1.230	.405		
9T1	1.605	.610		
10T1	1.605	.610		
11T1	1.980	.405		
12T1	1.980	.405		
13T1	2.355	.610		
14T1	2.355	.610		
15T1	2.730	.405	D	1006762-2
FT1	-.085	.785	E	FIND NO. 4&6
FT2	.375			
FT3	.665			
FT4	1.125			
FT5	1.415			
FT6	1.875			
FT7	2.165			
FT8	2.625	.785		
FT10	4.045	.420		
FT11	4.167	.640		
FT12	4.417			
FT13	4.667			
FT14	4.917			
FT15	5.167			
FT16	5.417			
FT17	5.667	.640	E	FIND NO. 4&6

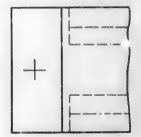
NO FT 9

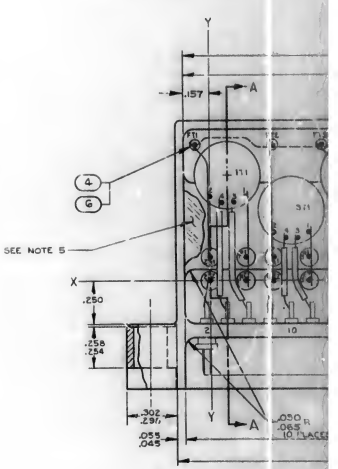
HOLE IDENT		
LETTER	HOLE DIA	QTY
A	.100/.104	79
B	.153/.157	9
C	.216/.220	7
D	.382/.389	8
E	.058/.062	16

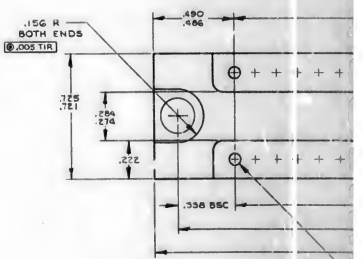


SECTION A-A



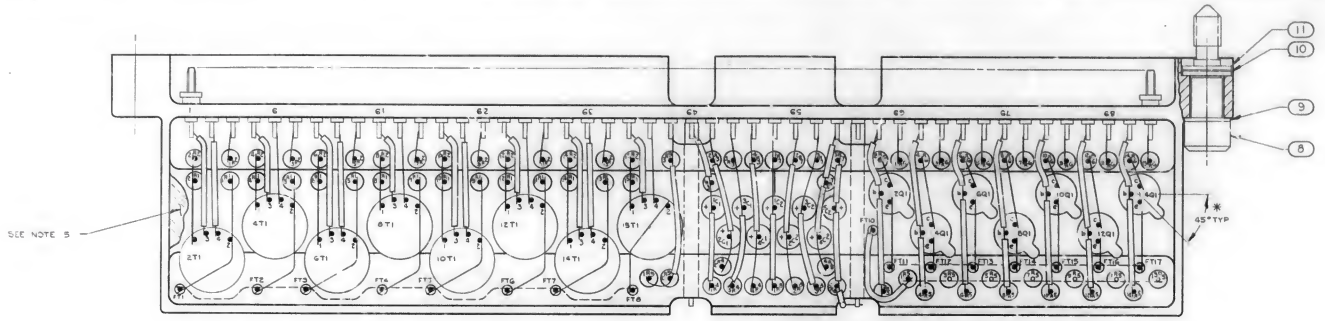


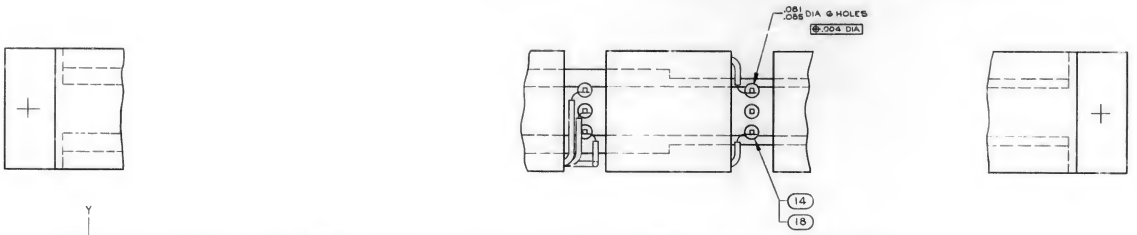


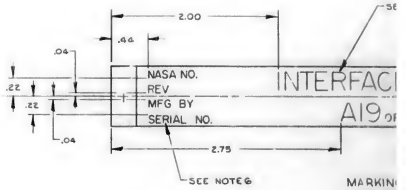


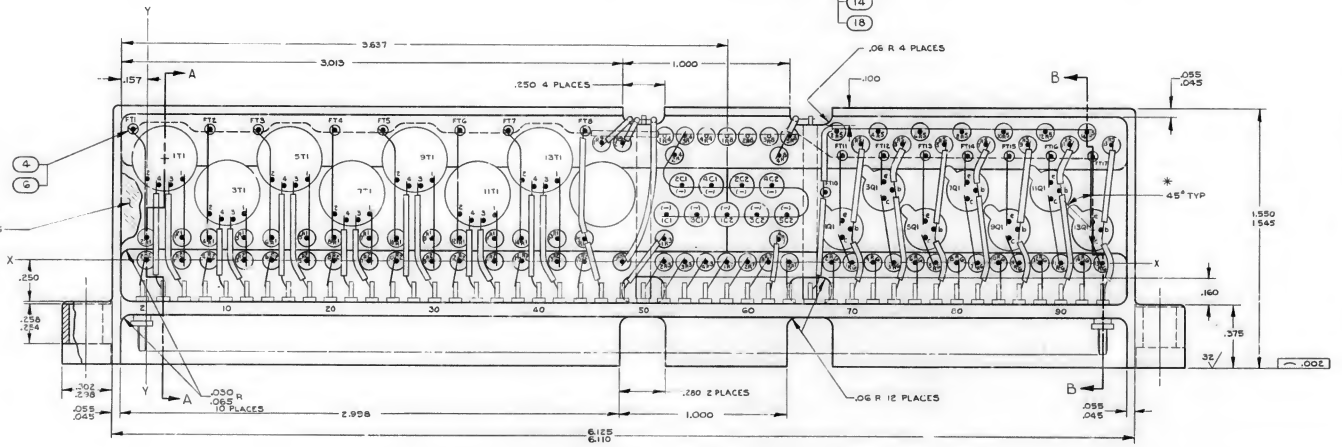
NOTES

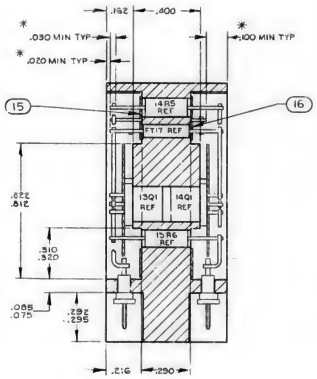
1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. NOTES FOR FIND NO. 1
   A. MATL: MAG ALLOY ZK60A-T5 PER QQ-M-31
   B. FINISH: ANODIZE PER MIL-M-45202 TYPE I CLASS C
   C. ALL SURFACES 125 UNLESS OTHERWISE SPECIFIED
   D. REMOVE BURRS & BREAK SHARP EDGES .005/.015
   E. ALL FILLETS & RADII TO BE .005/.020 UNLESS OTHERWISE SPECIFIED
3. ALL CONNECTIONS TO BE MADE BY WELDING PER ND 1002005 & ND 1002003
4. STAKE ALL RESISTORS, CAPACITORS & TRANSFORMERS PER ND 1002009
5. ENCAPSULATE MODULE PER ND1002002 (BLACK POLYURETHANE FOAM)
6. MARK .093 HIGH WHITE CHARACTERS PER ND 1002122 TYPE II CLASS 1 PER ND 1002018 & SERIALIZE PER ND1002023
7. MARK .250 HIGH WHITE CHARACTERS PER ND 1002122 TYPE II CLASS 1 PER ND 1002013
8. o WHITE DOT & DOTTED LEADS INDICATE LOWER LEVEL WIRING
9. • BLK DOT & SOLID LEADS INDICATE UPPER LEVEL WIRING
10. APPLY FIND NO. 7 TO INTERFACES PRIOR TO ASSEMBLY
11. FT DENOTES FEED THRU
12. AR DENOTES AS REQUIRED
13. * DENOTES DIMS THAT DO NOT PERTAIN TO FIND NO. 1



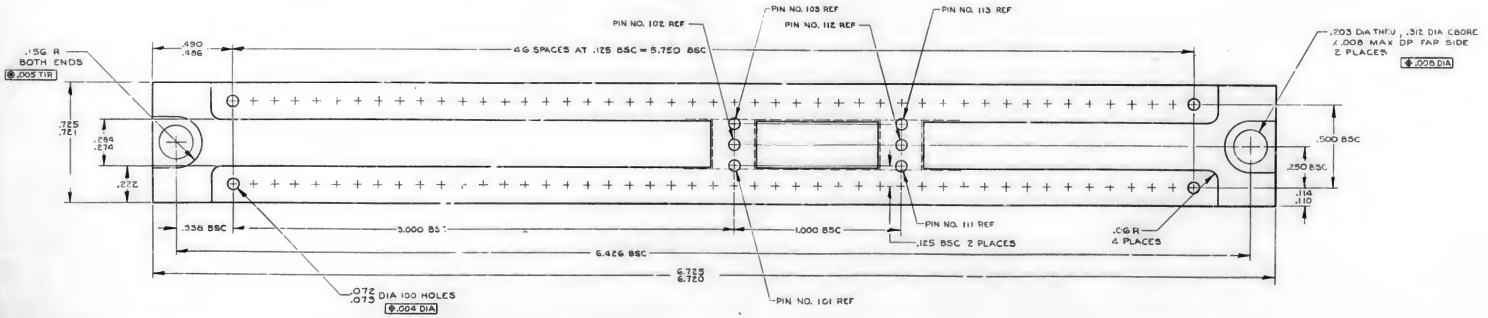




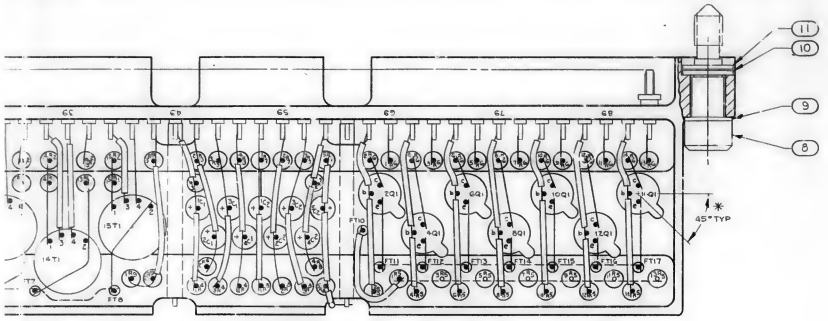


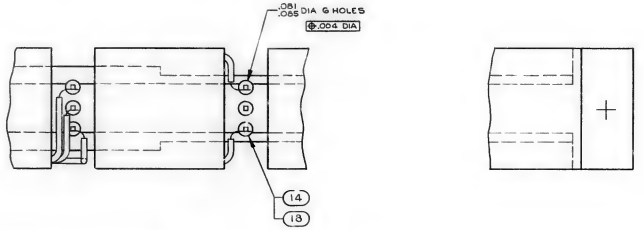


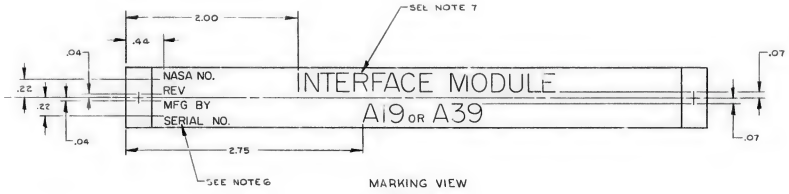
SECTION B-B



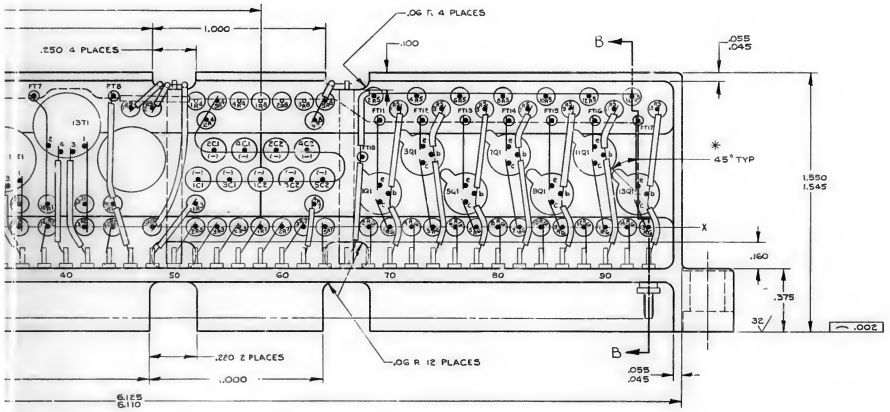
1003799

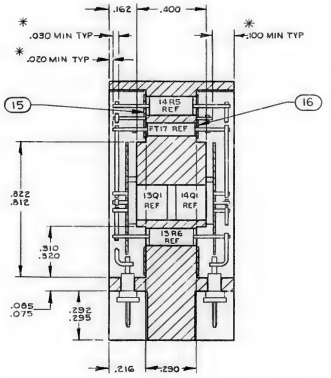




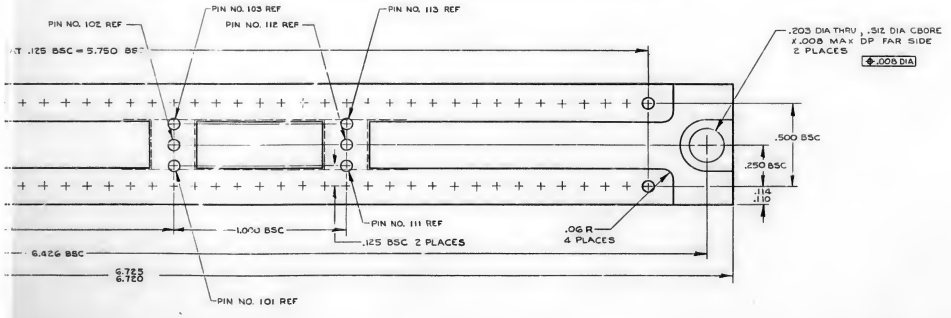


MARKING VIEW
SCALE 2-1





SECTION B-B



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 09792 DATE 6/3/67

REF	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		SCHEMATIC	
AR	1006776-20	INSULATIC SLEEVING	18
AR	1006828-12	TAPE, INSULATION	17
1		INSULATOR	16
1		INSULATOR	15
6	1006782-5	CONTACT, WRAPOST	14
1		INSULATOR	13
1		INSULATOR	12
2	MS16633-4015	RING, RETAINING	11
2	1004546-3	WASHER, FLAT	10
2	1004336-1	WASHER, FLAT	9
2	1004573-1	SCREW, JACKING	8
AR	100 4579	COMPOUND, THERMOCONDUCTIVE	7
AR	1006776-22	INSULATION, SLEEVING	6
AR	1006757-1	WIRE, ELECTRICAL	5
AR	1006757-8	WIRE, ELECTRICAL	4
100	1006775	INSULATOR, WRAPOST	3
94	1006782-1	CONTACT, WRAPOST	2
1		HEADER, HOUSING	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
.XX ±0.02 .XXX ±0.005 ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2A
HEAT TREATMENT —
FINISH SEE NOTE 2B
NEXT ASSY USED ON APPLICATION

MIT INSTRUMENTATION LAB
DRAWN [illegible] DATE 6/3/67
CHECKED
APPROVAL
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DESIGN LAYOUT
INTERFACE MODULE
A19 OR A39

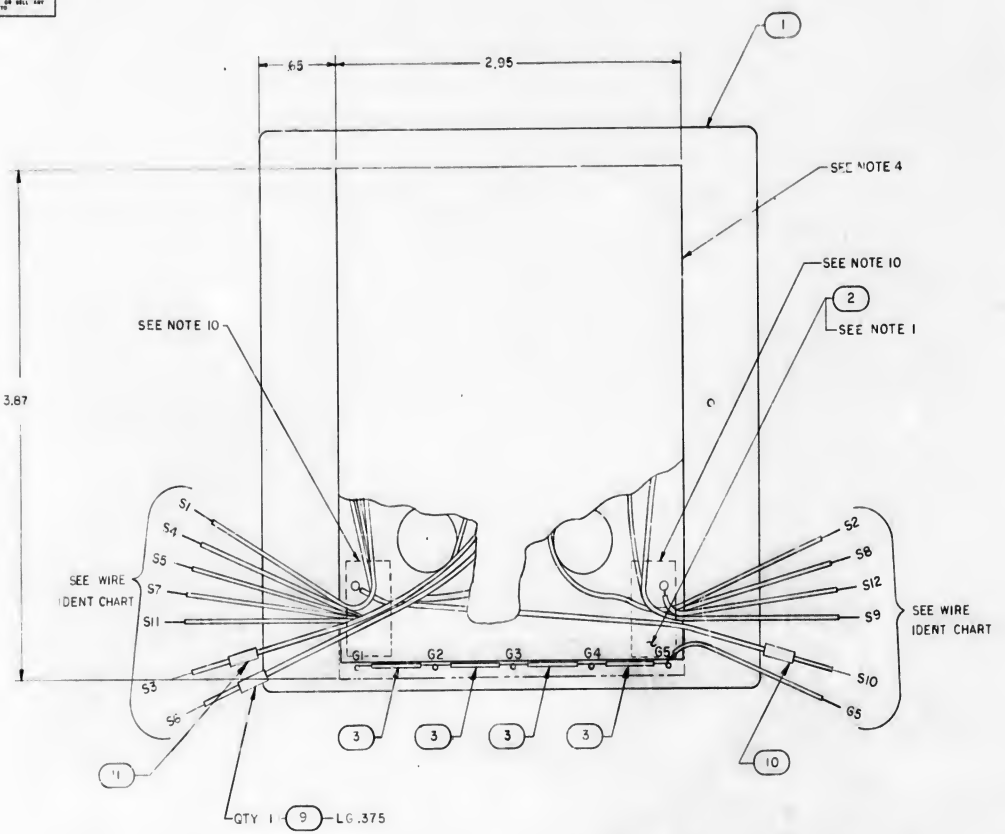
CODE IDENT NO. 80126 SIZE J NASA DRAWING NO. 1003799
SCALE 4 - 1 WT SHEET 1 OF 1

1003799

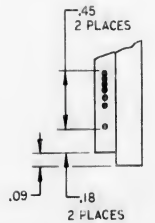
1003799

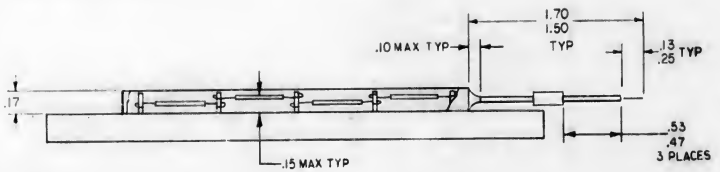
1003800 E

REVISIONS 12-7-65			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13433 DR [illegible] CHK [illegible] RTM	9/23/64	[illegible]
B	REVISED PER TDRR 14277 DR [illegible] CHK [illegible] RTM	12/21/64	[illegible]
C	REVISED PER TDRR 15648 DR J.B. Brown CHK JCJ RTM	3/9/65	[illegible]
D	REVISED PER TDRR 19229 DR R. Ripley CHK [illegible] RTM	9/1/65	[illegible]
E	REVISED PER TDRR 20558 DR R. Ripley CHK [illegible] RTM	11/29/65	[illegible]

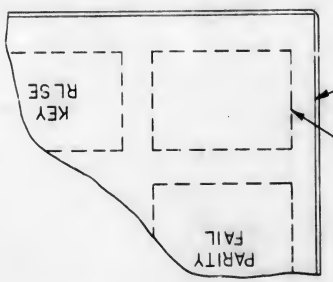


WIRE IDENT CHART			
LEAD DESIGNATION	FIND NO.	COLOR CODE (REF) BASIC	TRACER
S1	12	YEL	—
S2	13	YEL	GRN
S4	14	BLK	YEL
S5	15	YEL	ORN
S7	16	RED	YEL
S8	17	YEL	BLU
S9	18	YEL	VIO
S11	19	YEL	BRN
S12	20	YEL	GRY
~~S7=8~~	~~21~~	~~GRY~~	~~—~~
~~S10=8~~	~~21~~	~~GRY~~	~~—~~
G5	3	BLK	—
S3	22&11	YELLOW SLEEVING	
S6	22&9	BLACK SLEEVING	
S10	22&10	RED SLEEVING	





NOTES
1. BOND FIND NO. 8 & FIND NO. 2 TO FIND NO. 1 PER ND1002004, TYPE II OR TYPE V
2. SOLDER PER ND1002071 USING SOLDER PER ND1002075
3. ~~MARK EACH WIRE WITH ITS INDIVIDUAL PIN LETTER & NUMBER PER ND1002019~~
4. ENCAPSULATE AREA SHOWN PER ND1002236, CURE SCHEDULE A
5. ~~ALL WIRES TO BE FIND NO. 4 UNLESS OTHERWISE SPECIFIED~~
6. * DENOTES LENGTH IN FEET
7. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
8. ~~SLEEVING PER MIL-I-23053, CLASS 2, SIZE 14. COLOR BLK FOR FIND NO. 9, COLOR RED FOR FIND NO. 10, COLOR YEL FOR FIND NO. 11~~
9. ~~CRIMP LEADS FOR SOLDERLESS CONNECTIONS PER ND100220~~
10. STAKE WIRES IN INDICATED AREAS TO FIND NO. 2 PER ND1002004 TYPE V
11. IDENTIFY WITH DRAWING NUMBER AND REVISION PER ND1002019



*	1.5	1010416-20	WIRE, ELECTRICAL	22
~~*~~	~~1.0~~	~~1010416-13~~	~~WIRE, ELECTRICAL~~	~~21~~
*	.5	1010416-187	WIRE, ELECTRICAL	20
*	.5	1010416-123	WIRE, ELECTRICAL	19
*	.5	1010416-178	WIRE, ELECTRICAL	18
*	.5	1010416-169	WIRE, ELECTRICAL	17
*	.5	1010416-149	WIRE, ELECTRICAL	16
*	.5	1010416-141	WIRE, ELECTRICAL	15
*	.5	1010416-147	WIRE, ELECTRICAL	14
*	.5	1010416-160	WIRE, ELECTRICAL	13
*	.5	1010416-15	WIRE, ELECTRICAL	12
*	.04	1006322-103	SLEEVING, INSULATION	11
*	.04	1006322-078	SLEEVING, INSULATION	10
*	.04	1006322-028	SLEEVING, INSULATION	9
	1	1004856	INSULATOR, FRONT, ALARM DISPLAY	8
	~~.3~~	~~1000242-1~~	~~FERRULE, ELECTRICAL~~	~~7~~
	~~.5~~	~~1000243-1~~	~~FERRULE, ELECTRICAL~~	~~6~~
*	.5	1010278-1	WIRE, SHIELDED	5
~~*~~	~~3.0~~	~~1010416-10~~	~~WIRE, ELECTRICAL~~	~~4~~
*	.5	1010416-11	WIRE, ELECTRICAL	3
	1	1004815	BOARD, INSULATOR	2
	1	1006745	INDICATOR E/L (ALARM)	1
QTY REQD		PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.

1005750 INTERCONNECTION DIAGRAM REF

LIST OF MATERIALS

1003758	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.01 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DRAWN [illegible] DATE 9-22-64
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 9-22-64
MIT APPROVAL
MIT APPROVAL [illegible]

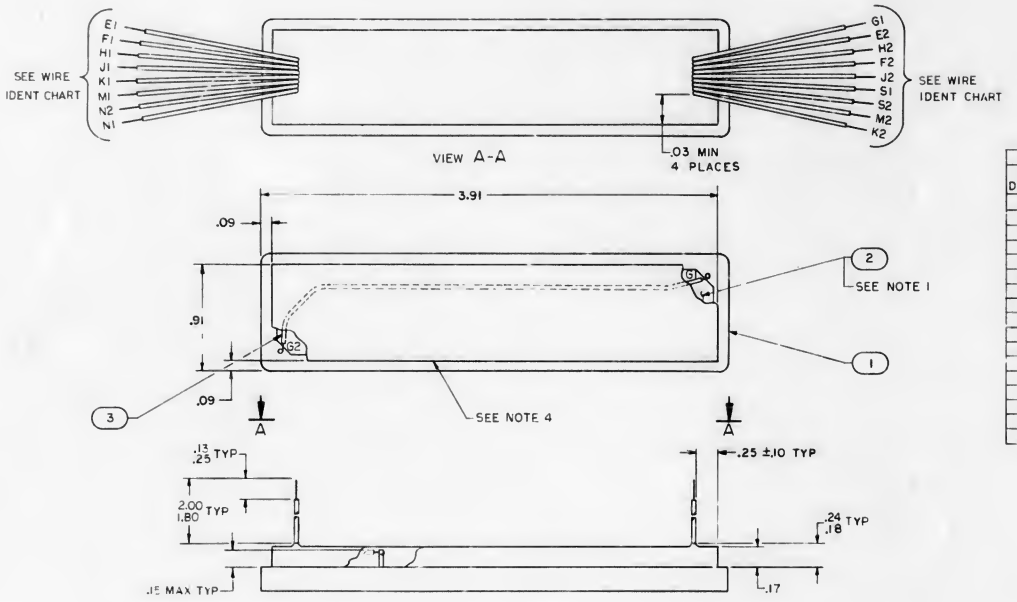
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR E/L ASSY (ALARM)
AGC DSKY, NAV
100 SERIES

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1003800
SCALE 2/1	WT	SHEET 1 OF 1

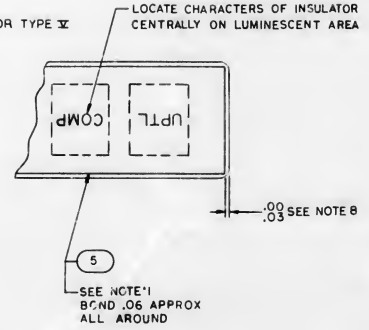
1003801 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13433 DR J. Lyke CHK [illegible]	11/24/64	
B	REVISED PER TDRR 14277 DR [illegible] CHK [illegible]	12/4/64	
C	REVISED PER TDRR 15648 DR [illegible] CHK [illegible]	2/9/65	
D	REVISED PER TDRR 17248 DR [illegible] CHK [illegible]	5/4/65	
E	REVISED PER TDRR 19229 DR [illegible] CHK [illegible]	7/16/65	
F	REVISED PER TDRR 20558 DR [illegible] CHK [illegible]	9/24/65	
G	REVISED PER TDRR 20560 DR [illegible] CHK [illegible]	9/24/65	



WIRE IDENT CHART			
LEAD DESIGNATION	FIND NO.	COLOR CODE (REF) BASIC	TRACER
E1	4	WHT	——
F1	6		RED
H1	7		ORN
J1	8		GRN
K1	9		BLU
M1	10		BRN
N1	11	WHT	VIO
E2	12	RED	WHT
F2	13		——
H2	14		ORN
J2	15		GRN
K2	16		BLU
M2	17		BRN
N2	18	RED	VIO
S1	19	YEL	——
S2	20	YEL	GRN
G1	3	BLK	——

NOTES
1. BOND FIND NO.5 AND FIND NO.2 TO FIND NO.1 PER NDI002004, TYPE II OR TYPE V
2. SOLDER PER ND 1002071 USING SOLDER PER NDI002075
3. ~~MARK EACH WIRE WITH ITS INDIVIDUAL PIN LETTER & NUMBER PER ND 1002019~~
4. ENCAPSULATE AREA SHOWN PER ND 1002236, CURE SCHEDULE A
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. ~~ALL WIRES TO BE FIND NO.4 UNLESS OTHERWISE SPECIFIED~~
7. * DENOTES LENGTH IN FEET
8. AFTER LOCATING FIND NO.5 AS SPECIFIED, TRIM TO DIMENSION SHOWN
9. IDENTIFY WITH DRAWING NUMBER AND REVISION PER NDIC02019



		1005750	INTERCONNECTION DIAGRAM
*	.7	1010416-160	WIRE, ELECTRICAL
*	.7	1010416-15	WIRE, ELECTRICAL
*	.7	1010416-176	WIRE, ELECTRICAL
*	.7	1010416-121	WIRE, ELECTRICAL
*	.7	1010416-167	WIRE, ELECTRICAL
*	.7	1010416-156	WIRE, ELECTRICAL
*	.7	1010416-140	WIRE, ELECTRICAL
*	.7	1010416-13	WIRE, ELECTRICAL
*	.7	1010416-194	WIRE, ELECTRICAL
*	.7	1010416-182	WIRE, ELECTRICAL
*	.7	1010416-128	WIRE, ELECTRICAL
*	.7	1010416-173	WIRE, ELECTRICAL
*	.7	1010416-164	WIRE, ELECTRICAL
*	.7	1010416-146	WIRE, ELECTRICAL
*	.7	1010416-137	WIRE, ELECTRICAL
	1	1004809	INSULATOR, FRONT, PROGRAM DISPLAY
*	.7	1010416-20	WIRE, ELECTRICAL
*	0.7	1010416-11	WIRE, ELECTRICAL
	1	1004813	BOARD, INSULATOR
	1	1006744	INDICATOR E/L (PROG)

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

1003809		HEAT TREATMENT
1003758		FINAL FINISH
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.01 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT INSTRUMENTATION LAB Cambridge, Mass.
DRAWN [illegible] DATE 9/16/64
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

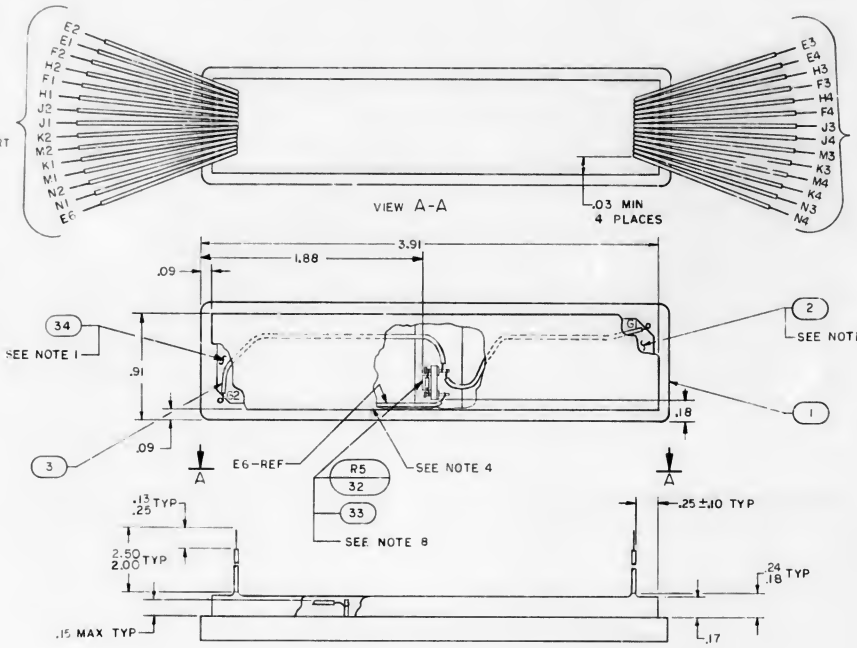
INDICATOR E/L ASSY (PROG)
AGC DSKY, NAV & MAIN
100 SERIES

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1003801
SCALE 2/1	WT	SHEET 1 OF 1

MASTER

1003802 D

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13433 DR [illegible] CHK [illegible]	11/3/64	[illegible]
B	REVISED PER TDRR 14277 DP [illegible] CHK [illegible]	12/4/64	[illegible]
C	REVISED PER TDRR 15648 DR [illegible] CHK [illegible]	2/8/65	[illegible]
D	REVISED PER TDRR 20558 DR [illegible] CHK [illegible]	8/4/65	[illegible]



WIRE IDENT CHART			
LEAD DESIGNATION	FIND NO.	COLOR CODE (REF) BASIC	TRACER
E1	4	WHT	——
F1	5		RED
H1	6		ORN
J1	7		GRN
K1	8		BLU
M1	9		BRN
N1	10	WHT	VIO
E2	11	RED	WHT
F2	12		——
H2	13		ORN
J2	14		GRN
K2	15		BLU
M2	16		BRN
N2	17	RED	VIO
E3	18	ORN	WHT
F3	19		RED
H3	20		——
J3	21		GRN
K3	22		BLU
M3	23		BRN
N3	24	ORN	VIO
E4	25	GRN	WHT
F4	26		RED
H4	27		ORN
J4	28		——
K4	29		BLU
M4	30		BRN
N4	31	GRN	VIO
G1	3	BLK	——
G2	3	BLK	——
E6	3	BLK	——

NOTES
1. BOND FIND NO. 2 AND FIND NO. 34 TO FIND NO 1 PER ND1002004 TYPE II OR TYPE V
2. SOLDER PER ND1002071 USING SOLDER PER ND1002075
3. ~~MARK EACH WIRE WITH ITS INDIVIDUAL PIN LETTER & NUMBER PER ND1002019~~
4. ENCAPSULATE AREA SHOWN PER ND1002236, CURE SCHEDULE A
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. ~~ALL WIRES TO BE FIND NO.4 UNLESS OTHERWISE SPECIFIED~~
7. * DENOTES LENGTH IN FEET
8. BOND FIND NO. 32 TO FIND NO. 33, AND FIND NO. 33 TO FIND NO 2 PER ND1002004, TYPE II
9. IDENTIFY WITH DRAWING NUMBER AND REVISION PER ND1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	1005753	INTERCONNECTION DIAGRAM	REF
	1005750	INTERCONNECTION DIAGRAM	REF
1	1004862	BOARD, INSULATOP	34
1	1004823-011	HOLDER, COMPONENT	33
1	1006750-72	RESISTOR	32
* .7	1010416-179	WIRE, ELECTRICAL	31
* .7	1010416-124	WIRE, ELECTRICAL	30
* .7	1010416-170	WIRE, ELECTRICAL	29
* .7	1010416-16	WIRE, ELECTRICAL	28
* .7	1010416-142	WIRE, ELECTRICAL	27
* .7	1010416-133	WIRE, ELECTRICAL	26
* .7	1010416-197	WIRE, ELECTRICAL	25
* .7	1010416-177	WIRE, ELECTRICAL	24
* .7	1010416-122	WIRE, ELECTRICAL	23
* .7	1010416-168	WIRE, ELECTRICAL	22
* .7	1010416-159	WIRE, ELECTRICAL	21
* .7	1010416-14	WIRE, ELECTRICAL	20
* .7	1010416-131	WIRE, ELECTRICAL	19
* .7	1010416-195	WIRE, ELECTRICAL	18
* .7	1010416-176	WIRE, ELECTRICAL	17
* .7	1010416-121	WIRE, ELECTRICAL	16
* .7	1010416-167	WIRE, ELECTRICAL	15
* .7	1010416-158	WIRE, ELECTRICAL	14
* .7	1010416-140	WIRE, ELECTRICAL	13
* .7	1010415-13	WIRE, ELECTRICAL	12
* .7	1010416-130	WIRE, ELECTRICAL	11
* .7	1010416-182	WIRE, ELECTRICAL	10
* .7	1010416-128	WIRE, ELECTRICAL	9
* .7	1010416-173	WIRE, ELECTRICAL	8
* .7	1010416-164	WIRE, ELECTRICAL	7
* .7	1010415-146	WIRE, ELECTRICAL	6
* .7	1010416-137	WIRE, ELECTRICAL	5
* .7	1010416-20	WIRE, ELECTRICAL	4
* 0.9	1010416-11	WIRE, ELECTRICAL	3
1	1004863	BOARD, INSULATOR	2
1	1006740	INDICATOR E/L (V-N)	1

LIST OF MATERIAL

1003809	
1003758	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ±.01 ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB Cambridge, Mass.
DRAWN [illegible] DATE 8/4/65
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 8-6-65
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

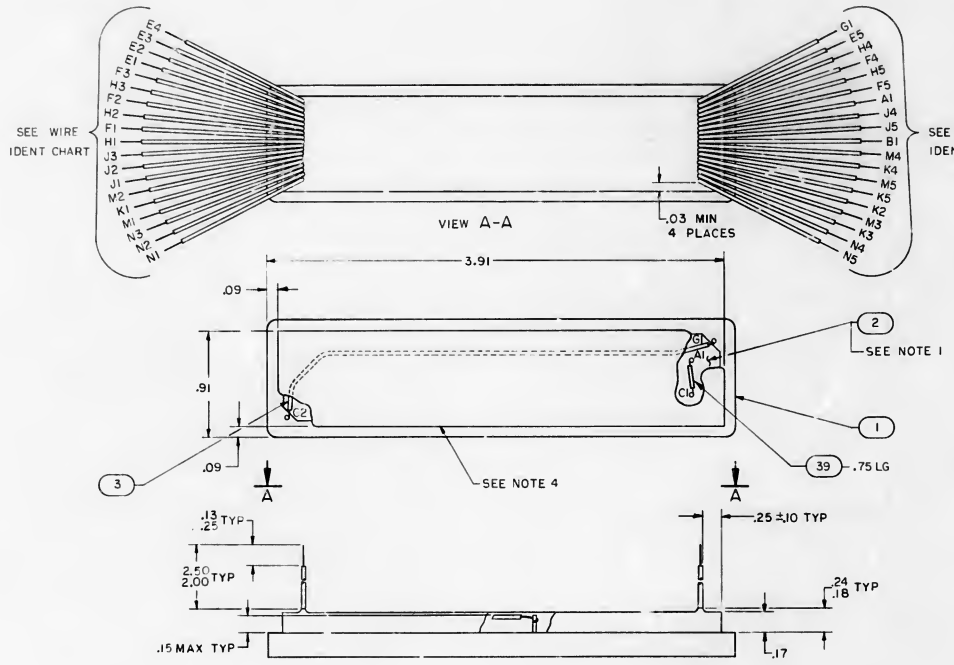
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

INDICATOR E/L ASSY (V-N) AGC DSKY, NAV & MAIN 100 SERIES

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1003802
SCALE 2/1	WT	SHEET 1 OF 1

E 1003803

SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 13433 DR [illegible] CHK [illegible] RTM	12/9/64	[illegible]
B	REVISED PER TDRR 14277 DR D.A. Clement CHK [illegible] RTM	1/14/64	[illegible]
C	REVISED PER TDRR 15648 DR G.J. Bisson CHK JCJ RTM	2/1/65	[illegible]
D	REVISED PER TDRR 17248 DR R. Blough CHK [illegible] RTM	5/25/65	[illegible]
E	REVISED PER TDRR 20558 DR W. Ripley CHK Alger RTM	7/6/65	[illegible]



WIRE IDENT CHART

LEAD DESIGNATION	FIND NO.	COLOR CODE (REF) BASIC	TRACER
E1	4	WHT	——
F1	5		RED
H1	6		ORN
J1	7		GRN
K1	8		BLU
M1	9		BRN
N1	10	WHT	VIO
E2	11	RED	WHT
F2	12		——
H2	13		ORN
J2	14		GRN
K2	15		BLU
M2	16		BRN
N2	17	RED	VIO
E3	18	ORN	WHT
F3	19		RED
H3	20		——
J3	21		GRN
K3	22		BLU
M3	23		BRN
N3	24	ORN	VIO
E4	25	GRN	WHT
F4	26		RED
H4	27		ORN
J4	28		——
K4	29		BLU
M4	30		BRN
N4	31	GRN	VIO
E5	32	BLU	WHT
F5	33		RED
H5	34		ORN
J5	35		GRN
K5	36		——
M5	37		BRN
N5	38	BLU	VIO
A1	39	YEL	RED
B1	40	YEL	BLK
G1	3	BLK	——

NOTES
1. BOND FIND NO. 2 TO FIND NO. 1 PER ND1002004, TYPE II OR TYPE V
2. SOLDER PER ND1002071 USING SOLDER PER ND1002075
3. ~~MARK EACH WIRE WITH ITS INDIVIDUAL PIN LETTER & NUMBER PER ND1002019~~
4. ENCAPSULATE AREA SHOWN PER ND1002236, CURE SCHEDULE A
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. ~~ALL WIRES TO BE FIND NO.4 UNLESS OTHERWISE SPECIFIED~~
7. * DENOTES LENGTH IN FEET
8. IDENTIFY WITH DRAWING NUMBER AND REVISION PER ND1002019

		QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
			1005750	INTERCONNECTION DIAGRAM	REF
*	.7		1010416-114	WIRE, ELECTRICAL	40
*	.7		1010416-132	WIRE, ELECTRICAL	39
*	.7		1010416-180	WIRE, ELECTRICAL	38
*	.7		1010416-125	WIRE, ELECTRICAL	37
*	.7		1010416-17	WIRE, ELECTRICAL	36
*	.7		1010416-161	WIRE, ELECTRICAL	35
*	.7		1010416-143	WIRE, ELECTRICAL	34
*	.7		1010416-134	WIRE, ELECTRICAL	33
*	.7		1010416-198	WIRE, ELECTRICAL	32
*	.7		1010416-179	WIRE, ELECTRICAL	31
*	.7		1010416-124	WIRE, ELECTRICAL	30
*	.7		1010416-170	WIRE, ELECTRICAL	29
*	.7		1010416-16	WIRE, ELECTRICAL	28
*	.7		1010416-142	WIRE, ELECTRICAL	27
*	.7		1010416-133	WIRE, ELECTRICAL	26
*	.7		1010416-197	WIRE, ELECTRICAL	25
*	.7		1010416-177	WIRE, ELECTRICAL	24
*	.7		1010416-122	WIRE, ELECTRICAL	23
*	.7		1010416-168	WIRE, ELECTRICAL	22
*	.7		1010416-159	WIRE, ELECTRICAL	21
*	.7		1010416-14	WIRE, ELECTRICAL	20
*	.7		1010416-131	WIRE, ELECTRICAL	19
*	.7		1010416-195	WIRE, ELECTRICAL	18
*	.7		1010416-176	WIRE, ELECTRICAL	17
*	.7		1010416-121	WIRE, ELECTRICAL	16
*	.7		1010416-167	WIRE, ELECTRICAL	15
*	.7		1010416-158	WIRE, ELECTRICAL	14
*	.7		1010416-140	WIRE, ELECTRICAL	13
*	.7		1010416-13	WIRE, ELECTRICAL	12
*	.7		1010416-194	WIRE, ELECTRICAL	11
*	.7		1010416-182	WIRE, ELECTRICAL	10
*	.7		1010416-128	WIRE, ELECTRICAL	9
*	.7		1010416-173	WIRE, ELECTRICAL	8
*	.7		1010416-164	WIRE, ELECTRICAL	7
*	.7		1010416-146	WIRE, ELECTRICAL	6
*	.7		1010416-137	WIRE, ELECTRICAL	5
#	.7		1010416-20	WIRE, ELECTRICAL	4
*	0.7		1010416-11	WIRE, ELECTRICAL	3
		1	1004814	BOARD, INSULATOR	2
		1	1006739-1	INDICATOR E/L (REGISTER)	1

LIST OF MATERIALS

1003809	
1003758	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.01 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB Cambridge, Mass.
SPEC NO. CONTRACT
DRAWN D. Jameson DATE 2/4/1964
CHECKED R. Richard
APPROVAL [illegible] Sept 15/64
APPROVAL [illegible]
NASA APPROVAL W.D. Rhodes 12-22-64
MIT APPROVAL
MIT APPROVAL [illegible]

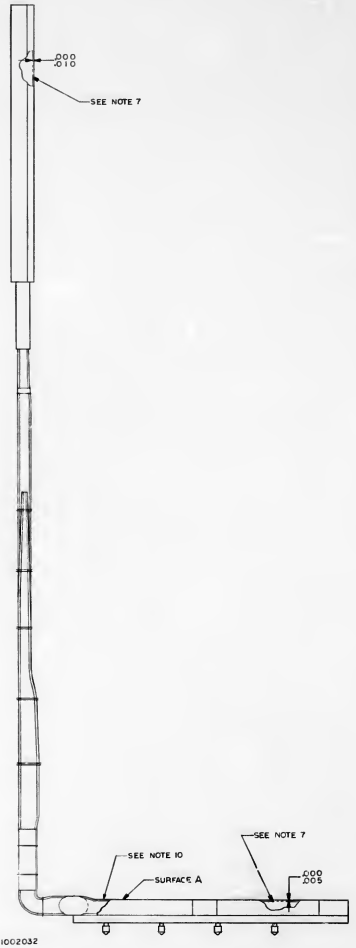
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

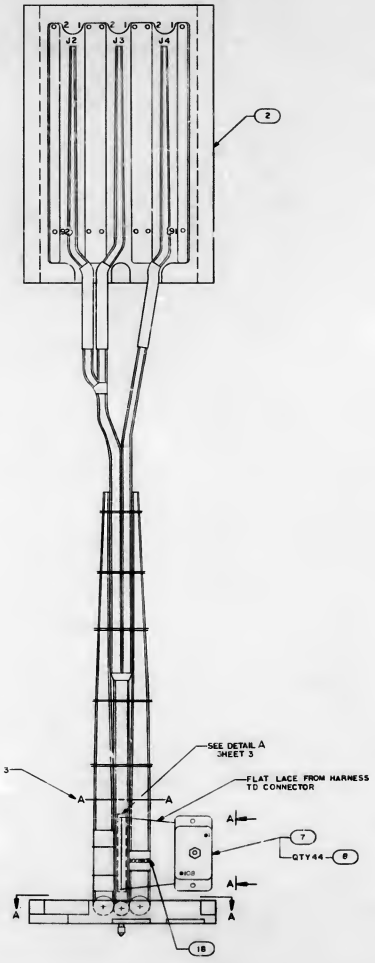
INDICATOR E/L ASSY (REG)
AGC DSKY, NAV & MAIN
100 SERIES

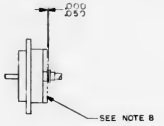
CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	D	1003803
SCALE 2/1	WT	SHEET 1 OF 1

1003805 B

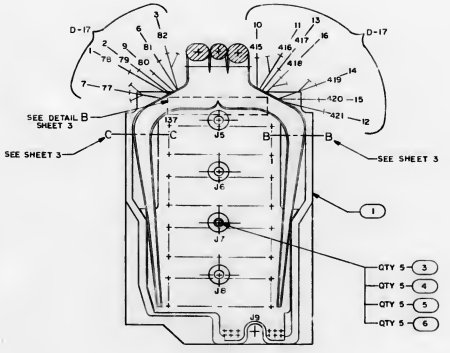
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TORR 14477 DR [illegible] CHK [illegible]	4/15/69	[illegible]
B	REPLACED W/ TH CHANGES BY REV C PER TORR 20558 DR [illegible] CHK [illegible]	8/1/69	[illegible]







VIEW A-A



SECTION A-A

(B) REPLACED WITH CHANGES BY REV C

NOTES:
1. FOR SYMBOLS FABRICATION AND REQUIRED TEST SEE ND1002032
2. SOLDER PER ND1002071
3. STRIP ALL LEADS .19 & TIN
4. # DENOTES LENGTH IN FEET
5. TERMINATE SHIELDS OF FIND NO. 9 AT FIND NO. 1 WITHIN HARNESS JUST BEFORE POINT OF BREAK OUT WITH .37 OF NO. 13
6. MIL-C-27072, CLASS 17, COLOR BLK, FOR FIND NO. 12 SIZE NO. 14, FOR FIND NO. 11 SIZE NO. 5, FOR FIND NO. 13 SIZE NO. 16
7. ENCAPSULATE INDICATED AREAS PER ND1002217
8. ENCAPSULATE INDICATED AREAS USING SILASTIC RUBBER PER ND1002009 METHOD E
9. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
10. FLAT LACE SIDE OF HARNESS TO ALLOW TRUNK TO LIE BELOW SURFACE A

FOR LIST OF MATERIALS SEE SHEET 3

QTY REQD	PART OR IDENT. NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL		MIT INSTRUMENTATION LAB CAMBRIDGE MASS	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
		DRAWN [illegible] DATE 7-28-69 CHECKED [illegible] APPROVED [illegible] APPROVED [illegible]	WIRING HARNESS, BRANCHED AGC DSKY, NAV 100 SERIES
1003758	HEAT TREATMENT FINAL FINISH	NASA APPROVAL [illegible] 8-1-69 MIT APPROVAL [illegible] MIT APPROVAL [illegible]	CODE IDENT NO. --- SIZE J NASA DRAWING NO. 1003805
NEXT ASSY APPLICATION	USED ON		SCALE 1/1 WT SHEET 1 OF 3

1003805 B

REVISIONS			
QTY	DESCRIPTION	DATE	APPROVAL
A	REVISED, PER TCRN 1447" DR Snyder CHK Curl 64	12-3-63 11/6/63	RC
B	REPLACED WITH CHANGES BY REV C PER TCRN 20558 DR Snyder CHK Curl 64	11-6-64	RC

ASSEMBLY INFORMATION CHART

FROM DESTINATION	FROM RUN NO	FROM COLOR	FROM AWG	FROM FIND NO	TO RUN NO	TO DESTINATION	REMARKS
J5-122	505	WHT	28	17	187	J2-50	
J2-58	186				504	J5-106	
J2-67	513				239	J4-98	
J4-50	243				552	J5-77	
J5-50	527				251	J4-15	
J4-11	250				541	J5-16	
J5-26	515				231	J3-77	
J3-85	232				530	J5-30	
J5-5	514				214	J3-60	
J3-58	215				529	J5-9	
J5-6	525				244	J4-14	
J4-6	245				539	J5-74	
J5-75	544				192	J2-6	
J2-8	191				49	J7-82	
J7-99	35				200	J2-23	
J2-3	184				547	J5-34	
J5-14	551				246	J4-6	
J4-3	248				558	J5-99	
J5-58	580				217	J3-18	
J3-4	218				577	J5-62	
J5-104	578				225	J3-15	
J3-23	228				568	J5-39	
J5-20	575				241	J4-60	
J4-58	242				564	J5-38	
J5-37	559				183	J2-98	
J2-80	184				584	J5-84	
J5-103	573				208	J2-93	
J2-85	205				15	J6-77	
J6-84	17				211	J2-99	
J2-77	204				511	J5-108	
J5-24	509				182	J2-100	
J2-60	185				479	J6-26	
J6-103	11				213	J3-90	
J3-50	216				497	J6-108	
J6-37	22				235	J3-93	
J3-99	238				37	J7-103	
J7-50	454				224	J3-11	
J2-3	222				60	J7-12	
J7-8	447				219	J3-8	
J3-6	220				462	J7-74	
J7-84	41				212	J3-98	
J7-14	61				189	J2-18	
J2-14	190				47	J7-58	
J7-39	55				197	J2-15	
J2-11	186				38	J7-104	
J7-37	54				240	J4-90	
J4-53	235				73	J6-84	
J9-6	422				418		
	418	WHT	28	17	203	J2-69	
J4-9	249	WHT	26	15	257	J1-28	
J1-14	258				193	J2-1	
J2-91	207				259	J1-40	
J1-60	260				247	J4-1	
J4-17	252				243	J1-29	
J1-51	264				254	J4-91	
J1-41	266				206	J2-89	
J2-19	199				267	J1-61	
J1-2	268				510	J5-87	
J2-9	195				269	J1-30	
J1-16	270				229	J3-29	
J4-95	256				271	J1-42	
J1-62	274				221	J3-1	
J5-22	502				275	J1-3	
J1-31	276				198	J2-17	
J3-97	237				277	J1-53	
J1-73	278				226	J3-17	
J9-7	425				279	J1-71	
J1-17	280				202	J2-41	
J3-95	238				281	J1-43	
J1-63	282				223	J3-9	
J7-111	471				283	J1-4	
J1-32	284				210	J2-97	
J3-19	227				286	J1-74	
J1-18	287				201	J2-29	
J3-89	233				288	J1-44	
J1-64	289				253	J4-89	
J7-126	473				290	J1-5	
J1-65	291				500	J6-127	
J3-91	234				292	J1-33	
J1-19	293				209	J2-95	
J7-107	470				294	J1-6	
J1-7	295				446	J7-1	
J6-85	493				296	J1-66	
J1-61	297				520	J5-127	
J5-85	503				298	J1-8	
J1-22	299				517	J5-89	
J5-105	585				300	J1-9	
J1-34	301				79		
J6-111	498				302	J1-67	
J1-23	303				507	J5-23	
J5-120	579				304	J1-10	
J1-35	305				421		
J5-123	508				306	J1-24	
J1-11	307				464	J7-87	
	415				308	J1-70	
J1-25	310				431	J6-64	
J5-2	506				311	J1-47	
J1-12	312				463	J7-85	
	80				313	J1-37	
J1-57	314				418		
J3-31	230	WHT	26	15	265	J1-15	

ASSEMBLY INFORMATION CHART

REMARKS	FROM DESTINATION	FROM RUN NO	FROM COLOR	FROM AWG	FROM FIND NO	TO RUN NO	TO DESTINATION	REMARKS
		419	WHT	26	15	272		
		273				424	J6-3	
	J5-1	501				315	J1-26	
	J1-48	318				81		
	J7-22	431				417	J1-13	
	J1-38	318				420		
		76				320	J1-49	
	J1-39	321				417		
	J9-4	423	WHT	26	15	322	J1-59	
	J5-134	570	BLK	26	16	82		
		82				262	J1-1	
	J1-82	261				77		
		77				309	J1-56	
	J1-58	319				418		
		418				285	J1-69	
		77	BLK	26	16	188	J2-28	
*		179	SHLD	28	14	27	J7-136	
	J7-132	67				178		*
		174				46	J7-57	
	J8-136	66				178		*
		180				2	J6-132	
	J6-136	5				177		*
		175				580	J5-136	
	J8-128	76				163		*
		164				26	J6-126	
	J7-41	59				126		*
		125				576	J5-41	
	J5-101	569				127		*
		108				51	J7-31	
	J7-98	34				104		*
		105				535	J5-51	
	J5-110	518				83		*
		85				23	J6-41	
	J7-110	29				84		*
	J8-98	69				147		*
*		149	SHLD	28	14	9	J6-98	
		86	BLK	26	16	103		
		107				124		
		128				162		
		185				173		
		181				172		
		148				148		
		145	BLK	26	16	95	J6-132	
	J6-29	21	WHT	28	17	171		
		170				7	J6-93	
	J6-51	18				169		
		168				12	J6-72	
	J6-92	6				167		
		166				13	J6-73	
	J8-79	72				159		
		158				71	J8-76	
	J8-15	75				155		
		154				70	J8-100	
	J8-55	76				151		
		150				68	J8-87	
	J6-79	16				161		
		160				14	J8-76	
	J6-15	24				157		
		156				10	J6-100	
	J8-55	19				153		
		152				8	J6-97	
	J5-60	569				142		
		143				972	J5-61	
	J5-121	586				137		
		140				565	J5-59	
	J5-83	583				134		
		135				571	J5-19	
	J5-119	574				132		
		133				581	J5-21	
	J5-42	582				129		
		130				1	J5-137	
	J7-121	31				141		
		144				48	J7-61	
	J7-63	50				138		
		139				63	J7-21	
	J7-137	28				131		
		136				57	J7-42	
	J7-76	39				120		
		123				40	J7-79	
	J7-33	53				115		
		118				82	J7-15	
	J7-100	36				112		
		114				59	J7-10	
	J7-54	44				110		
		111				52	J7-32	
	J7-55	45				108		
		109				33	J7-87	
	J5-10	534				121		
		122				542	J5-33	
	J5-32	538				118		
		119				526	J5-29	
	J5-95	540				113		
		117				543	J5-54	
	J8-121	67				98		
		97				32	J7-90	
	J7-49	43				96		
		96				42	J7-47	
	J7-112	30				100		
		101				58	J7-4	
	J6-137	4	WHT	28	17	88		

ASSEMBLY INFORMATION CHART

REMARKS	FROM DESTINATION	FROM RUN NO	FROM COLOR	FROM AWG	FROM FIND NO	TO RUN NO	TO DESTINATION	REMARKS
		90	WHT	28	17	20	J6-83	
	J6-21	25				93		
		94				5	J8-121	
	J5-48	521				87		
		88				522	J5-70	
	J5-47	516				91		
		95				519	J5-90	
	J5-112	523				89		
		102	WHT	28	17	512	J5-4	
*	J6-57	487	SHLD	28	14	525		*
*		324				557	J5-57	*
*	J5-132	563				536		*
*		335				492	J8-67	*
*	J8-31	480				552		*
*		331				430	J8-31	*
*	J7-13	448				372		*
*		389				485	J7-91	*
*	J7-101	465				370		*
*		371				553	J5-35	*
*	J5-128	524				390		*
*		389				478	J6-13	*
*	J8-91	494				382		*
*		391				474	J7-128	*
*	J8-41	433				411		*
*		410				546	J5-13	*
*	J5-96	545				413		*
*		412	SHLD	28	14	496	J8-101	
	J9-8	428	BLK	26	16	414		
		409				393		
		388				373		
		368				337		
		334				526		
		323				327		
		350	BLK	26	16	353		
	J8-73	440	WHT	28	17	333		
		332				441	J8-92	
	J8-72	439				331		
		330				435	J8-51	
	J8-93	445				328		
		328				429	J8-29	
	J8-52	436				347		
		348				443	J8-95	
	J8-54	437				343		
		342				431	J8-32	
	J8-10	427				339		
		338				432	J8-33	
	J8-52	485				349		
		348				435	J8-95	
	J6-54	486				345		
		344				481	J8-32	
	J6-10	475				341		
		340				482	J8-33	
	J7-38	453				360		
		359				449	J7-18	
	J7-59	457				355		
		354				458	J7-60	
	J7-118	472				367		
		358				450	J7-15	
	J5-18	567				346		
		363				550	J5-97	
	J5-55	548				364		
		362				562	J5-100	
	J5-36	558				382		
		361				555	J5-15	
	J5-76	549				357		
		356				561	J5-79	
	J7-72	480				345		
		384				456	J7-52	
	J7-73	461				383		
		380				488	J7-95	
	J7-92	466				379		
		378				467	J7-93	
	J7-51	455				375		
		376				452	J7-28	
	J5-52	536				347		
		386				532	J5-72	
	J5-73	537				382		
		381				528	J5-92	
	J5-51	531				377		
		379				533	J5-93	
	J7-70	459				408		
		405				499	J6-119	
	J9-18	477				408		
		404				483	J6-36	
	J8-42	484				401		
		400				478	J6-9	
	J6-60	489				386		
		395				490	J6-61	
	J6-59	488				389		
		388				554	J5-114	
	J8-119	444				403		
		402				445	J8-137	
	J8-63	438				397		
		394				428	J8-21	
	J8-42	434	WHT	28	17	407		

INTERNAL GROUND SHEATH CONNECTIONS

FROM	TO	LENGTH	FIND NO.
83	84	.75	16
84	85	.75	
104	105	.75	
105	106	.75	
125	126	.75	
126	127	.75	
147	148	.75	
163	164	.75	
174	175	.75	
175	176		
176	177		
177	178		
178	179		
179	180	.75	
324	325	.75	
335	336	.75	
351	352	.75	
369	370	.75	
370	371	.75	
371	372	.75	
389	390	.75	
380	381	.75	
391	392	.75	
410	411	.75	
411	412	.75	
412	413	.75	16

(B) REPLACED WITH CHANGES BY REV C

NOTES:
* SEE GROUND SHEATH CONNECTION CHART

FOR LIST OF MATERIALS SEE SHEET 3

QTY A	QTY B	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ±, DECIMALS ±, ANGLES ±. DO NOT SCALE THIS DRAWING. MATERIAL. HEAT TREATMENT. FINAL FINISH. NEXT ASSY. USED ON. APPLICATION.

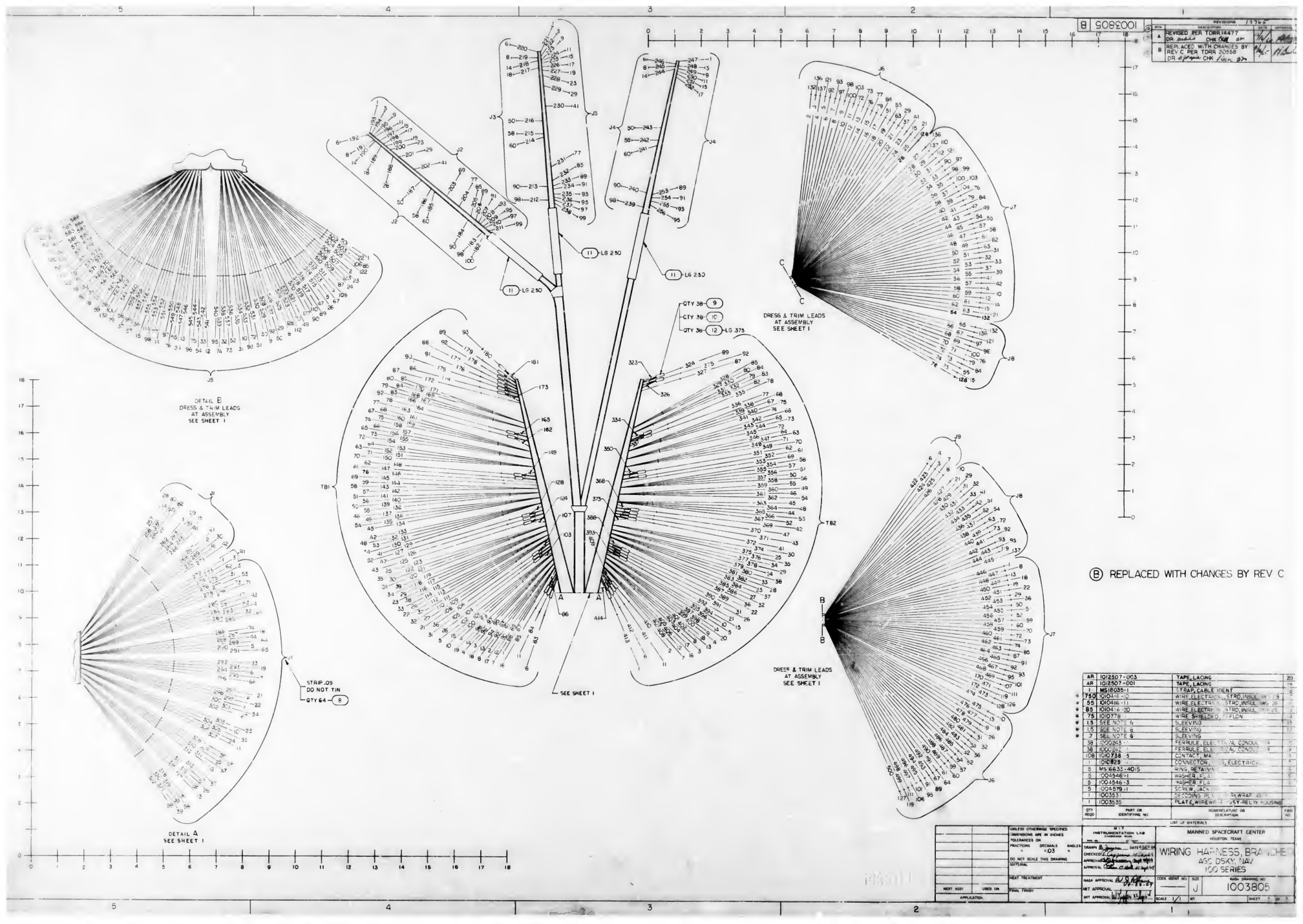
MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DRWN R. Rosenthal DATE 1-24-64
CHECKED C. Cooper
APPROVED E. Copps
APPROVAL NASA MSC
APPROVAL MIT

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

WIRING HARNESS, BRANCHED
AGC DSKY, NAV
100 SERIES

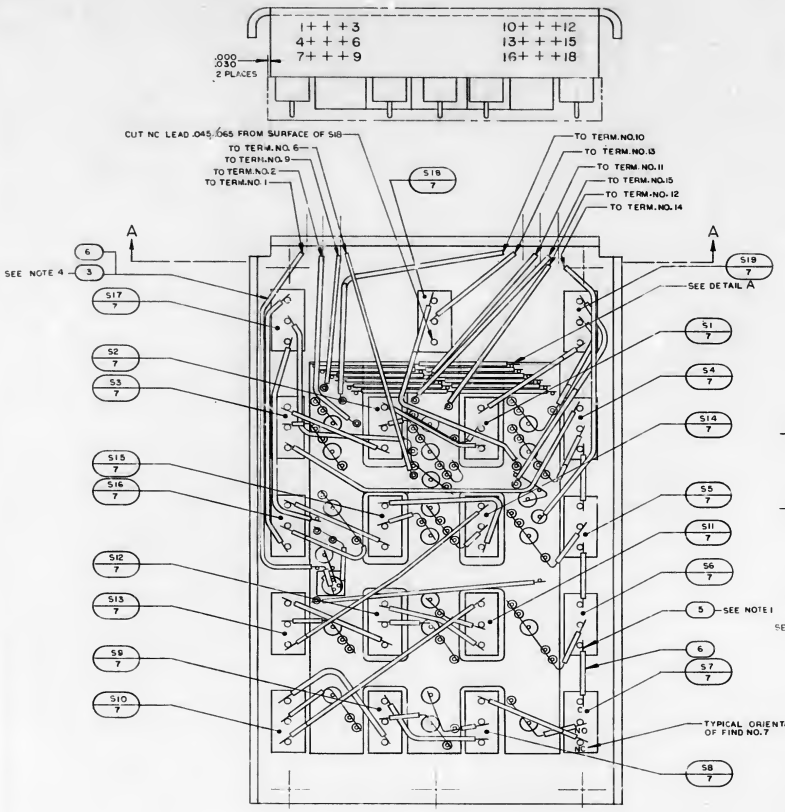
NASA APPROVAL 11-6-64
MIT APPROVAL
MIT APPROVAL

CODE IDENT NO. —
SIZE J
NASA DRAWING NO. 1003805
SCALE NONE
SHEET 2 OF 3

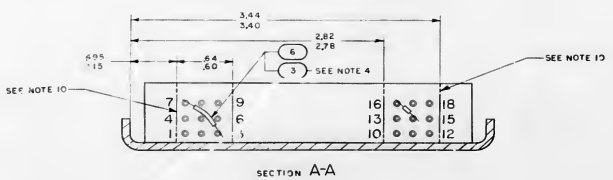

1003805 B
REVISIONS
REVISED PER TDRR 14477
REPLACED WITH CHANGES BY REV C PER TDRR 20588
J3
J5
J4
J2
J1
J6
J7
J8
J9
TB1
TB2
11 LG 250
11 LG 250
QTY 38 9
QTY 38 10
QTY 38 12 LG 375
DETAIL B
DRESS & TRIM LEADS AT ASSEMBLY SEE SHEET 1
DRESS & TRIM LEADS AT ASSEMBLY SEE SHEET 1
DRESS & TRIM LEADS AT ASSEMBLY SEE SHEET 1
DETAIL A SEE SHEET 1
STRIP .09 DO NOT TIN
QTY 64 8
SEE SHEET 1
(B) REPLACED WITH CHANGES BY REV C
AR 10125O7-003 TAPE, LACING
AR 10125O7-001 TAPE, LACING
1 MS16035-1 STRAP, CABLE IDENT
750 10104I5-20 WIRE, ELECTRICAL, STRD, INSUL
55 10104I6-11 WIRE, ELECTRICAL, STRD, INSUL
85 10104I6-20 WIRE, ELECTRICAL, STRD, INSUL
75 1010778 WIRE, SHIELDED, TEFLON
* 15 SEE NOTE 5 SLEEVING
* 15 SEE NOTE 6 SLEEVING
* 7 SEE NOTE 5 SLEEVING
38 1000263 FERRULE, ELECTRICAL CONDUIT
38 1000262 FERRULE, ELECTRICAL CONDUIT
108 1010738-5 CONTACT, MALE, ELECTRICAL
1 1010825 CONNECTOR, RECEPTACLE, ELECTRICAL
5 MS 16633-4015 RING, RETAINING
5 1004546-1 WASHER, FLAT
5 1004546-3 WASHER, FLAT
5 1004579-1 SCREW, JACK
1 1003531 GROUNDING STRAP, FLEXIBLE, SLEEVED
1 1003536 PLATE, WIREWRAP, ASSY-RELAY HOUSING
QTY REQD | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | FIND NO.
LIST OF MATERIALS
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
.03
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY
USED ON
APPLICATION
M.I.T. INSTRUMENTATION LAB
DRAWN
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS
WIRING HARNESS, BRANCHE
ASC DSKY, NAV
100 SERIES
CODE IDENT NO. 71468
SIZE J
NASA DRAWING NO. 1003805
SCALE 1/1
WT
SHEET 1 OF 1

J 1003806

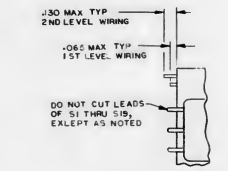
SYM	REVISIONS DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 13438 DRAWN CHK		
B	CHANGED PER TDRR 17249 DRAWN CHK		
C	CHANGED PER TDRR 20563 DRAWN CHK		



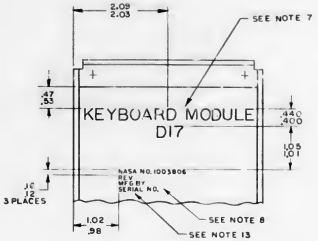
VIEW A-A
SHOWN WITH POTTING REMOVED
SCALE 2/1



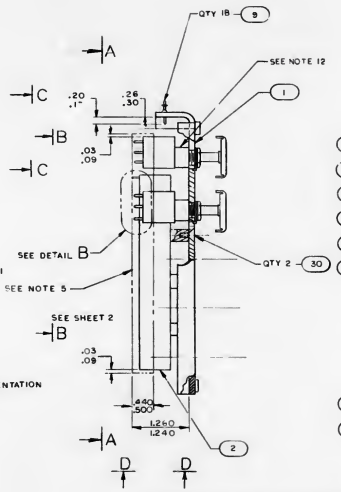
SECTION A-A

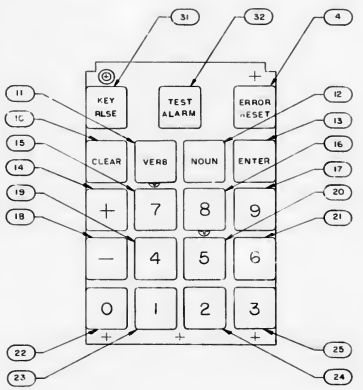


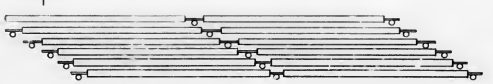
DETAIL B
SCALE 2/1



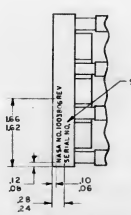
VIEW C-C







DETAIL A
FOR CLARITY ONLY
SCALE 4/1



VIEW D-D

	1009754	SCHEMATIC	REF
1	1010406-7	COIL, RF, CHOKE	38
6	1006750-1	RESISTOR, FIXED FILM	37
1	1004605	INSULATOR, PLATE	36
1	1006750-56	RESISTOR, FIXED FILM	35
1	1006752	TRANSISTOR, SILICON, TYPE NPN	34
2	1006750-32	RESISTOR, FIXED FILM	33
1	1004602-17	BUTTON, KEYBOARD	32
1	1004602-19	BUTTON, KEYBOARD	31
2	MS35200-12	SCREW, FLAT HEAD	30
2	1006755-79	CAPACITOR, FIXED, TANTALUM	29
45	1006751	SEMICONDUCTOR DEVICE DIODE	28
12	1006755-57	CAPACITOR, FIXED, TANTALUM	27
2	1006750-39	RESISTOR, FIXED FILM	26
1	1004602-16	BUTTON, KEYBOARD	25
1	1004602-15	BUTTON, KEYBOARD	24
1	1004602-14	BUTTON, KEYBOARD	23
1	1004602-13	BUTTON, KEYBOARD	22
1	1004602-12	BUTTON, KEYBOARD	21
1	1004602-11	BUTTON, KEYBOARD	20
1	1004602-10	BUTTON, KEYBOARD	19
1	1004602-9	BUTTON, KEYBOARD	18
1	1004602-8	BUTTON, KEYBOARD	17
1	1004602-7	BUTTON, KEYBOARD	16
1	1004602-6	BUTTON, KEYBOARD	15
1	1004602-5	BUTTON, KEYBOARD	14
1	1004602-4	BUTTON, KEYBOARD	13
1	1004602-3	BUTTON, KEYBOARD	12
1	1004602-2	BUTTON, KEYBOARD	11
1	1004602-1	BUTTON, KEYBOARD	10
18	1006784-9	TERMINAL, FEED THRU	9
18	1006777-24	CAPACITOR, FIXED, CERAMIC	8
19	1006739	SWITCH, PUSH	7
* 93	1006776-21	INSULATION, SLEEVING	6
* 12.0	1006757-1	WIRE, ELECTRICAL, .010 X .020	5
1	1004602-18	BUTTON, KEYBOARD	4
* 8.5	1006757-13	WIRE, ELECTRICAL, .020 DIA	3
1	1004761	BLOCK, COMPONENT	2
1	1004800	PANEL, FRONT	1
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.

SEE NOTE 14

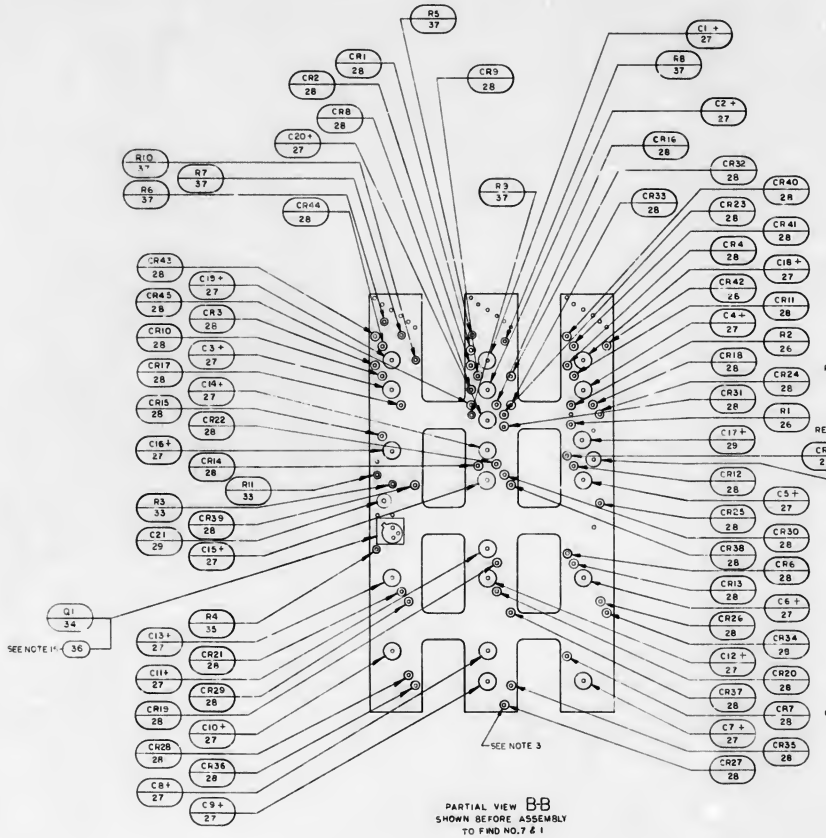
LIST OF MATERIALS

NOTES:
1. ALL CONNECTIONS TO BE MADE BY WELDING PER ND1002005 WHEN USING FIND NO.5
2. ~~WIRING STANDARDS FOR WELDED UNITS IN ACCORDANCE WITH ND1000600~~
3. STAKE COMPONENTS TO FIND NO.2 PER ND1002009 METHOD A
4. SOLDER ALL CONNECTIONS TO FIND NO.9 PER ND1002071
5. ENCAPSULATE MODULE PER ND1002036 TO DIMENSIONS SHOWN
6. * DENOTES LENGTH IN FEET
7. MARK 24/26 HIGH WHITE PER ND1002019 & ND1002122 TYPE II CLASS 2, USING MARKING INK DWG. NO. 1006271-1
8. SERIALIZE PER ND1002023
9. BRUSH COAT THIS SURFACE PER ND1002009 METHOD B TO A MINIMUM HEIGHT OF .015 ABOVE COMPONENT LEADS & FEEDTHRUS
10. ENCAPSULATE THIS AREA PER ND1002217
11. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
12. FIND NO.7 SHALL MEET THE FOLLOWING ACTUATION REQUIREMENTS BEFORE AND AFTER ENCAPSULATION PER NOTE 5:
    PRE TRAVEL: .093 MIN/.188 MAX
    OVER TRAVEL: .060 MIN
13. MARK .28/.10 HIGH WHITE PER ND1002019 AND ND1002122 TYPE II CLASS I USING MARKING INK 1006271-1
14. MOUNTING TORQUE ON FIND NO. 7 TO BE 17-19 IN LBS
15. BOND FIND NO. 38 TO FIND NO. 2 PER ND1002004 TYPE V
16. WORKMANSHIP FABRICATION AND INSPECTION REQUIREMENTS PER ND1002069

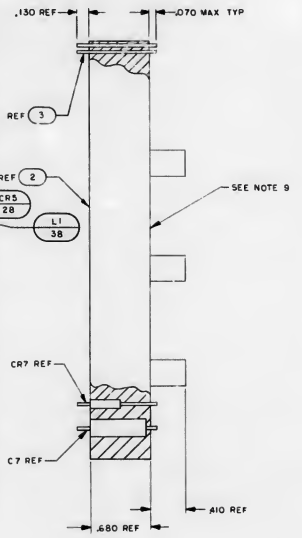
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	MIT INSTRUMENTATION LAB Cambridge, Mass.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
		TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	DRAWN [illegible] DATE 2/6/68 CHECKED [illegible] APPROVAL [illegible] APPROVAL [illegible]	KEYBOARD MODULE ASSEMBLY (D17) AGC DSKY, NAV 100 SERIES
		DO NOT SCALE THIS DRAWING	NASA APPROVAL [illegible]	CODE IDENT NO 80230 SIZE E NASA DRAWING NO 1003806
1003706		MATERIAL	MIT APPROVAL [illegible]	SCALE 1/1 WT SHEET 1 OF 2
NEXT ASSY	USED ON	HEAT TREATMENT FINAL FINISH	MIT APPROVAL [illegible]	
APPLICATION				

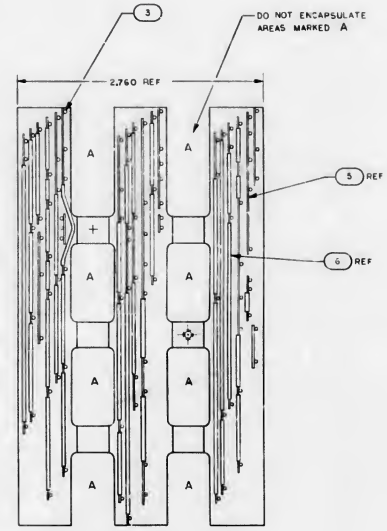
1003806

SYM	DESCRIPTION	DATE	APPROVAL
A	CHANGED PER TDRR 13438 DR [illegible] CHK [illegible]	[illegible]	[illegible]
B	CHANGED PER TDRR 17249 DR [illegible] CHK [illegible]	[illegible]	[illegible]
C	CHANGED PER TDRR 20563 DR [illegible] CHK [illegible]	[illegible]	[illegible]



PARTIAL VIEW B-B
SHOWN BEFORE ASSEMBLY
TO FIND NO.7 & 1





CATHODES (FIND NO.28) THIS
SIDE TYP 45 PLACES

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
1003706 NEXT ASSY USED ON
APPLICATION

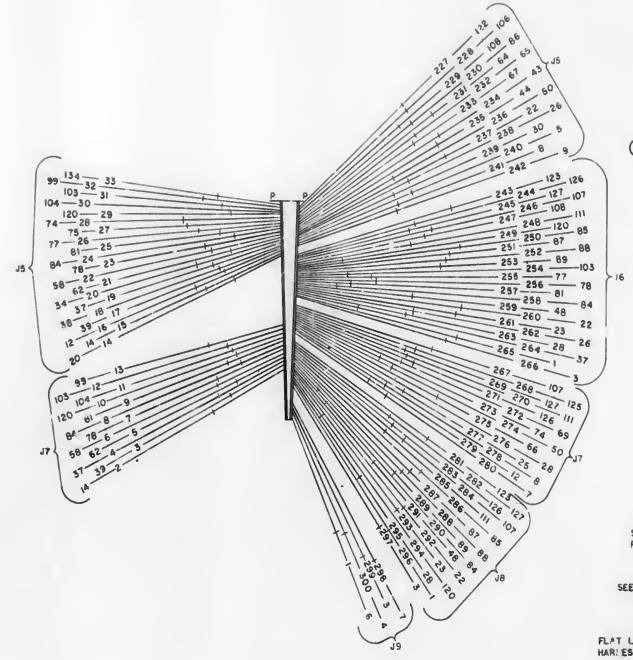
M I T INSTRUMENTATION LAB Cambridge, Massachusetts
DRAWN [illegible] DATE 8/7/64
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 8-12-64
MIT APPROVAL [illegible]
MIT APPROVAL [illegible] 8/7/64

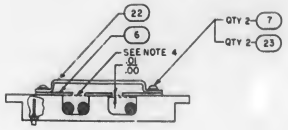
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

KEYBOARD MODULE ASSEMBLY (D17)
AGC DSKY, NAV 100 SERIES

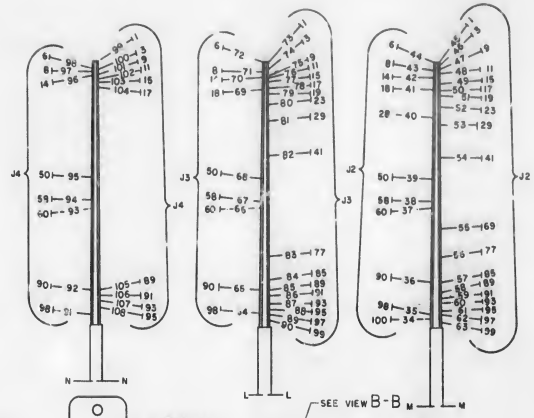
CODE IDENT NO 80230 | SIZE E | NASA DRAWING NO 1003806
SCALE 2/1 | WT | SHEET 2 OF 2

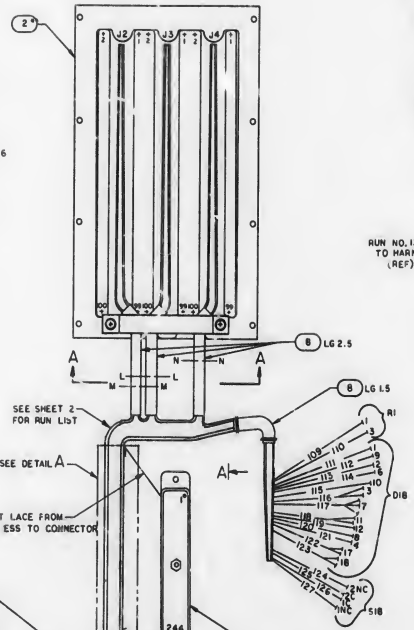
1003807 -

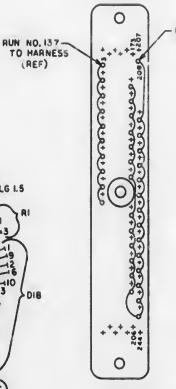




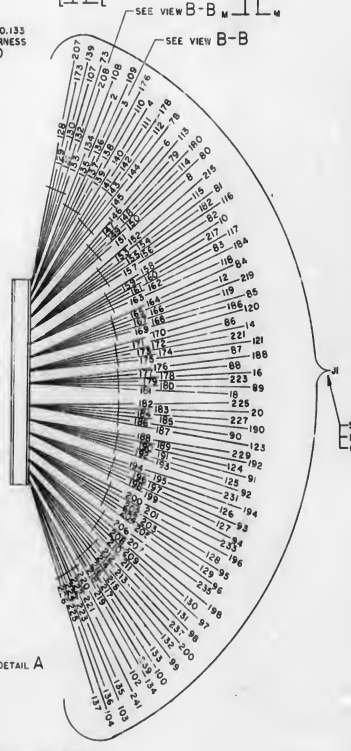
SECTION A-A

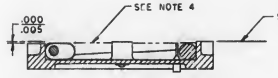




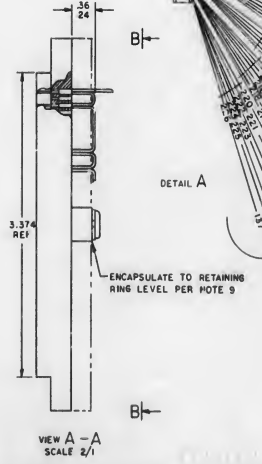


VIEW B-B
SCALE 2/1





SECTION B-B



DETAIL A

VIEW A-A
SCALE 2/1

NOTES

1. WIRING AND FABRICATION OF HARNESS PER ND1002032 STRIP ALL LEADS .15 AND TIN
2. MIL-I-23053 CLASS 2. COLOR BLACK, FOR FIND NO. 8 SIZE NO. 5, FOR FIND NO. 15 SIZE NO. 12 . FOR FIND NO. 16 SIZE NO. 16
3. MIL-I-631, TYPE F, FORM Ua, GRADE A, CLASS 1, CATEGORY 1, FOR FIND NO. 9 AWG SIZE 1/2
4. ENCAPSULATE INDICATED AREAS PER 1002217
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. SOLDER PER ND1002071
7. TERMINATE ALL SHIELDS AT FIND NO. 1 WITHIN HARNESS JUST BEFORE POINT OF BREAKOUT WITH .37 OF FIND NO. 16
8. * DENOTES LENGTH IN FEET
9. ENCAPSULATE INDICATED AREA PER ND1002009 METHOD E
10. LACE HARNESS 3 PLACES TO FIND NO. 1 THRU INDICATED HOLES

FOR LIST OF MATERIALS SEE SHEET 4

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
		LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± .03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
DRAWN
CHECKED
APPROVED
APPROVED
APPROVED

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIRING HARNESS, BRANCHED AGC DSKY, MAIN 100 SERIES

1003707

J

1003807

SCALE 1/1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

ASSY INFORMATION CHART

REMARKS	FROM DESTINATION	RUN NO	DESCRIPTION COLOR	AWG	FIND NO	RUN NO	TO DESTINATION	REMARKS
	J-238	206	WHT	26	19	45	J2-1	
	J-5	47				182	J1-225	
	J-22	184				50	J2-19	
	J-15	5				188	J1-229	
	J-78	138				53	J2-29	
	J-4	54				221	J1-241	
	J-180	148				58	J2-89	
	J-6	55				142	J1-178	
	J-82	152				61	J2-95	
	J-7	62				162	J1-184	
	J-21	94				73	J3-1	
	J-3	76				200	J1-233	
	J-215	152				78	J3-17	
	J3-19	76				159	J1-217	
	J1-239	216				81	J3-29	
	J3-4	92				212	J1-237	
	J1-88	76				85	J3-89	
	J-32	86				169	J1-184	
	J1-190	185				88	J3-95	
	J1-07	89				189	J1-192	
	J1-219	166				99	J4-1	
	J4-9	101				173	J1-221	
	J1-223	179				104	J4-17	
	J4-89	108				201	J1-196	
	J1-194	195				106	J4-91	
	J4-95	198				213	J1-200	
	J1-16	178				111		
		142				165	J1-12	
	J1-5	145				113		
		114				181	J1-18	
	J1-10	158	WHT	26	19	115		
		116	BLK	26	3	129	J1-173	
	J1-207	128				117		
		117				133	J1-208	
	J1-3	135				118		
		119	BLK	26	3	137	J1-3	
	J1-8	151	WHT	26	19	119		
		121				172	J1-14	
	J1-139	130				122		
		124				46	J1-78	
	J1-79	147				125		
		126				140	J1-4	
	J1-20	183				232	J5-65	
	J5-72	237				203	J1-95	
	J1-88	177				249	J6-120	
	J6-81	257				180	J1-89	
	J1-90	186				256	J6-78	
	J1-98	221				267	J7-107	
	J7-125	268				157	J1-82	
	J1-100	217				269	J7-127	
	J7-111	270				205	J1-96	
	J1-97	209				271	J7-126	
	J7-69	272				150	J1-80	
	J1-83	161				275	J7-66	
	J7-28	276				215	J1-99	
	J1-81	154				277	J7-25	
	J7-7	280				164	J1-84	
	J1-94	199				294	J8-120	
	J9-7	290				207	J1-198	
	J1-73	132				300	J9-4	
	J1-85	168				29	J5-120	
	J5-81	28				171	J1-86	
	J1-87	175				23	J5-76	
	J7-120	10				191	J1-91	
	J1-92	193				9	J7-81	
	J7-78	7				197	J1-93	
	J2-69	55				123		
		123				110		
		120	WHT	26	19	127		
		117	BLK	26	3	40	J2-28	
	J5-122	227	WHT	26	19	39	J2-50	
	J5-106	228				38	J2-58	
	J5-108	229				56	J2-77	
	J5-86	230				34	J2-100	
	J5-67	233				91	J4-96	
	J5-50	236				103	J4-15	
	J5-26	238	WHT	26	19	83	J3-77	

ASSY INFORMATION CHART

REMARKS	FROM DESTINATION	RUN NO	DESCRIPTION COLOR	AWG	FIND NO	RUN NO	TO DESTINATION	REMARKS
	J5-30	239	WHT	26	19	84	J3-85	
	J5-5	240				66	J3-60	
	J5-8	241				96	J4-14	
	J5-9	242				67	J3-58	
	J6-108	247				68	J3-50	
	J6-103	254				65	J3-90	
	J6-77	255				57	J2-85	
	J6-84	258				63	J2-99	
	J6-26	262				37	J2-60	
	J6-37	264				87	J3-93	
	J7-74	273				72	J3-6	
	J7-50	274				76	J3-11	
	J7-8	278				71	J3-8	
	J7-12	279				74	J3-3	
	J8-84	290				107	J4-93	
	J9-5	299				109		
	J9-6	1	WHT	26	19	122		
	J5-134	33	BLK	26	3	116		
	J5-99	32	WHT	28	20	100	J4-3	
	J5-103	31				60	J2-93	
	J5-104	30				77	J3-16	
	J5-74	28				97	J4-8	
	J5-75	27				44	J2-6	
	J5-77	26				95	J4-50	
	J5-84	24				86	J2-90	
	J5-58	22				69	J3-18	
	J5-62	21				70	J3-14	
	J5-34	20				46	J2-3	
	J5-37	19				35	J2-98	
	J5-38	18				94	J4-58	
	J5-39	17				80	J3-23	
	J5-12	16				102	J4-11	
	J5-14	15				98	J4-6	
	J5-20	14				93	J4-60	
	J7-99	13				82	J2-23	
	J7-103	12				70	J3-99	
	J7-104	11				48	J2-11	
	J7-84	8				64	J3-96	
	J7-58	6				42	J2-14	
	J7-62	5				43	J2-8	
	J7-37	4				92	J4-90	
	J7-39	3				49	J2-15	
	J7-14	2	WHT	28	20	41	J2-18	
	J5-64	231	WHT	26	19	225	J1-104	
	J5-43	234				223	J1-103	
	J5-44	235				220	J1-102	
	J6-123	243				163	J1-119	
	J6-126	244				161	J1-111	
	J6-127	245				136	J1-109	
	J6-107	246				149	J1-114	
	J6-111	248				134	J1-108	
	J6-85	250				174	J1-121	
	J6-87	251				167	J1-119	
	J6-88	252				146	J1-113	
	J6-89	253				143	J1-112	
	J6-48	259				139	J1-110	
	J6-22	260				170	J1-120	
	J6-23	261				153	J1-115	
	J6-28	263				131	J1-107	
	J6-1	265				160	J1-117	
	J6-3	266				156	J1-116	
	J8-123	281				219	J1-134	
	J8-127	282				192	J1-126	
	J8-107	284				208	J1-130	
	J8-111	285				190	J1-124	
	J8-85	286				226	J1-137	
	J8-87	287				222	J1-135	
	J8-88	288				204	J1-129	
	J8-89	289				202	J1-128	
	J8-22	292				224	J1-136	
	J8-23	293				210	J1-131	
	J8-28	295				187	J1-123	
	J8-1	296				216	J1-133	
	J8-3	297				214	J1-132	
	J8-48	291				196	J1-126	
	J8-126	283	WHT	26	19	198	J1-127	

CONNECTOR JUMPER LIST

REMARKS	DESCRIPTION FROM	COLOR	AWG	FIND NO	TO	REMARKS
	J1-21	WHT	26	19	J1-19	
	J1-19				J1-17	
CABLE GROUP III	J1-17				J1-15	
	J1-15				J1-13	
	J1-13				J1-11	
REF	J-11				J1-9	
	J1-9				J1-7	
	J1-7				J1-5	
	J1-5				J1-3	WITH RUN NO.137
	J1-177				J1-179	
	J1-179				J1-181	
	J1-181				J1-183	
	J1-183				J1-185	
	J1-185				J1-187	
	J1-187				J1-189	
	J1-189				J1-191	
	J1-191				J1-193	
	J1-193				J1-195	
	J1-195				J1-197	
	J1-197				J1-199	
CABLE GROUP II	J1-199				J1-201	
	J1-201				J1-242	
	J1-242				J1-240	
REF	J1-240				J1-238	
	J1-238				J1-236	
	J1-236				J1-234	
	J1-234				J1-232	
	J1-232				J1-230	
	J1-230				J1-228	
	J1-228				J1-226	
	J1-226				J1-224	
	J1-224				J1-222	
	J1-222				J1-220	
	J1-220				J1-218	
	J1-218				J1-216	
	J1-216	WHT	26	19	J1-208	WITH RUN NO.133

FOR LIST OF MATERIALS SEE SHEET 4

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY USED ON
APPLICATION

MIT INSTRUMENTATION LAB Cambridge Mass

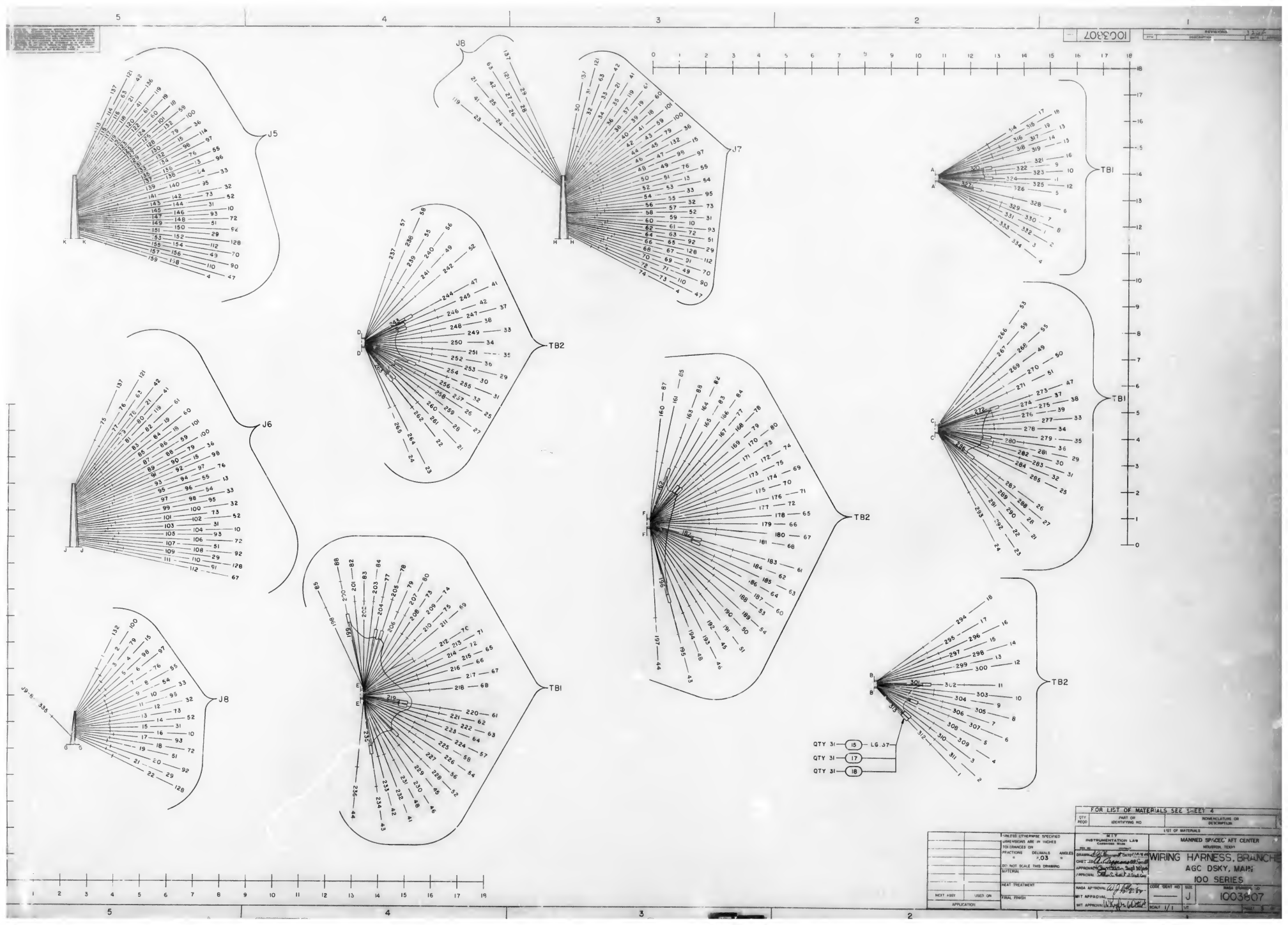
MANNED SPACECRAFT CENTER HOUSTON TEXAS

DRAWN [illegible] DATE 7/26/67
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]

WIRING HARNESS, BRANCHED AGC DSKY, MAIN 100 SERIES

NASA APPROVAL [illegible] DATE 7/26/67
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

CODE IDENT NO — SIZE J — NASA DRAWING NO 1003807
SCALE NONE WT SHEET 2 OF 4



FOR LIST OF MATERIALS SEE SHEET 4

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS .03 ANGLES ±	ITT INSTRUMENTATION LAB CAMBRIDGE, MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
DO NOT SCALE THIS DRAWING	DRAWN	WIRING HARNESS, BRANCH
MATERIAL	CHKD	AGC DSKY, MAIN
HEAT TREATMENT	APPROVED	100 SERIES
FINISH	NASA APPROVAL	CODE IDENT NO 80009 SIZE J NASA DWG NO 1003607
NEXT ASSY APPLICATION	USED ON	MIT APPROVAL SCALE 1/1 WT SHEET 3 OF 4

1003307

1003807 REVISIONS 13266

ASSY INFORMATION CHART

REMARKS	FROM DESTINATION	RUN NO	DESCRIPTION COLOR	AWG	FIND NO	RUN NO	TO DESTINATION	REMARKS
		304	WHT	28	20	87	J6-59	
	J6-18	85				306		
		306				84	J6-60	
	J6-36	90				310		
		309				83	J6-19	
	J6-6	82				303		
		300				26	J6-49	
	J6-21	25				297		
		296				69	J7-70	
	J7-49	70				330		
		329				154	J5-70	
	J5-2	153				334		
		333				156	J5-90	
	J5-49	155				331		
		332				158	J5-47	
	J5-4	159				326		
		325				75	J6-137	
	J6-121	76				315		
		314				77	J6-63	
	J6-42	78				294		
		295				81	J6-119	
	J6-21	79				317		
		316				28	J8-121	
	J8-63	27				298		
		299				29	J8-137	
	J7-137	30				266		
		267				37	J7-61	
	J7-119	36				242		
		241				45	J7-36	
	J7-15	47				292		
		293				50	J7-76	
	J7-97	49				288		
		289				141	J5-95	
	J5-32	142				278		
		279				140	J5-33	
	J5-54	139				281		
		280				146	J5-10	
	J8-93	147				251		
	J8-100	2				214		
		215				88	J6-100	
	J6-79	89				218		
		217				94	J6-76	
	J6-55	95				223		
		222				93	J6-97	
	J6-15	91				216		
		213				8	J8-55	
	J8-76	7				209		
		208				4	J8-15	
	J8-97	6				212		
		210				3	J8-79	
	J8-54	9				178		
		177				97	J6-54	
	J6-33	98				173		
		175				102	J5-52	
	J6-73	101				201		
		198				109	J6-29	
	J6-92	108				202		
		206				106	J6-72	
	J6-51	107				203		
		207				105	J6-93	
	J6-10	104				172		
		171				100	J6-32	
	J6-95	99				176		
		179				12	J8-32	
	J8-95	11				186		
		185				14	J8-52	
	J8-73	13				164		
		161				21	J8-29	
	J8-92	20				165		
		166				19	J8-51	
	J8-72	18				169		
		170				17	J8-93	
	J8-10	16				160		
		181				10	J8-33	
	J8-119	23				305		
		252				144	J5-52	
	J5-73	143				260		
		259				62	J7-72	
	J7-93	61				253		
		264				65	J7-29	
	J7-92	64				265		
		264				57	J7-73	
	J7-32	56				274		
		275	WHT	28	20	54	J7-33	

ASSY INFORMATION CHART

REMARKS	FROM DESTINATION	RUN NO	DESCRIPTION COLOR	AWG	FIND NO	RUN NO	TO DESTINATION	REMARKS
	J7-95	55	WHT	28	20	248		
		247				53	J7-52	
	J7-10	60				277		
		276				151	J5-29	
	J5-92	150				249		
		257				149	J5-51	
	J5-72	148				256		
		257				63	J7-51	
	J7-19	38				240		
		233				40	J7-18	
	J7-60	39				238		
		234				42	J7-59	
	J7-100	43				291		
		295				51	J7-55	
	J7-54	53				284		
		285				44	J7-79	
	J7-21	34				270		
		271				31	J7-121	
	J7-63	32				268		
		269				33	J7-42	
	J7-112	67				323		
		322				73	J7-47	
	J7-90	71				318		
		319				74	J7-4	
	J5-137	113				236		
		233				117	J5-21	
	J5-42	116				232		
		231				120	J5-119	
	J5-61	121				225		
		227				123	J5-60	
	J5-19	122				226		
		227				126	J5-59	
	J5-18	124				188		
		189				130	J5-36	
	J5-15	131				153		
		192				128	J5-100	
	J5-79	129				191		
		170				135	J5-76	
	J5-97	134				197		
		194				136	J5-55	
	J5-63	115				229		
		230	WHT	28	20	114	J5-121	
	J8-98	5	SHLD	28	21	220		*
*		221				92	J6-98	
*	J6-13	96				262		*
*		261				111	J6-91	
*	J6-67	112				168		*
*		167				127	J5-132	
*	J5-101	125				228		*
*		234				119	J5-41	
*	J5-136	118				163		*
*		195				133	J5-98	
*	J5-13	137				311		*
*		312				138	J5-96	
*	J5-31	145				283		*
*		287				48	J7-98	
*	J7-132	46				200		*
*		204				22	J8-128	
*	J8-31	15				184		*
*		183				103	J6-31	
*	J6-128	110				205		*
*		328				157	J5-110	
*	J5-128	152				255		*
*		258				66	J7-126	
*	J7-31	69				280		*
*		273				35	J7-41	
*	J7-101	41				244		*
*		245				52	J7-13	
*	J7-91	68				246		*
*		302				24	J8-41	
*	J7-110	72				324		*
*		321				80	J6-41	
*	J6-101	86	SHLD	28	21	307		*
	J8-132	1	BLK	26	3	211		
		211				219		
		174				182		
	J5-114	132				187		
	J9-8	335				327		
		320				313		
		301				286		
		272				263		
		243				235		
		199				196		
		162	BLK	26	3	160		

INTERNAL GROUND SHEATH CONNECTIONS

FROM	TO	LENGTH	FIND NO.
328	324	2.00	3
324	321	1.50	
312	311	1.50	
311	307	2.00	
307	302	2.00	
287	283	2.00	
283	280	1.75	
280	273	2.50	
262	261	1.50	
261	258	1.75	
258	255	2.00	
255	246	2.50	
246	245	1.75	
245	244	1.75	
234	228	2.00	
228	205	5.00	
205	204	1.75	
204	200	2.50	
221	220	1.75	
195	168	5.00	
168	167	1.50	
167	163	2.00	
184	183	1.75	3

* SEE GROUND SHEATH CONNECTION CHART

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
2	MS15795-303	WASHER, FLAT	23
1	1004630	BRACKET, CABLE SUPPORT	22
** 35	1010778-1	WIRE, ELECTRICAL, SHLD, AWG 28	21
** 200	1010416-10	WIRE, ELECTRICAL, STRD, AWG 28	20
** 200	1010416-20	WIRE, ELECTRICAL, STRD, AWG 26	19
31	1000243-1	FERRULE, ELECTRICAL CONDUCTOR	18
31	1000242-1	FERRULE, ELECTRICAL CONDUCTOR	17
** 1.5	SEE NOTE 2 & 7	SLEEVING	16
** 1.6	SEE NOTE 2	SLEEVING	15
5	1004546-1	WASHER, FLAT	14
5	1004546-2	WASHER, FLAT	13
5	1004579-2	SCREW, JACKING	12
5	MS16633-4015	RING, RETAINING	11
1	MS18036-1	STRAP, CABLE ID	10
** 125	SEE NOTE 3	SLEEVING	9
** 75	SEE NOTE 2	SLEEVING	8
2	MS35216-13	SCREW, PAN HD	7
1	1004582	PLATE, CABLE SUPPORT	6
244	1010738-1	CONTACT, (PIN)	5
1	MS3268-1	CONNECTOR, PLUG	4
** 20	1010416-11	WIRE, ELECTRICAL, STRD, AWG 26	3
1	1003547	CONN PL, WIRE WRAP ASSY (DECODING)	2
1	1003810	CONN PL, WIRE WRAP ASSY (RELAY)	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .X ±.03 .XX ± .XXX ± DO NOT SCALE THIS DRAWING 3 TRIAL

HEAT TREATMENT NEXT ASSY USED ON APPLICATION FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE MASS

DRAWN [illegible] 12-7-67
CHECKED [illegible] 12-7-67
APPROVAL [illegible] 12-7-67
APPROVAL [illegible] 12-8-67

NASA APPROVAL [illegible] 12-8-67
MIT APPROVAL [illegible] 12-8-67

MANNED SPACECRAFT CENTER HOUSTON TEXAS

WIRING HARNESS, BRANCHED
AGC DSKY, MAIN
100 SERIES

CODE IDENT NO. — SIZE J NASA "MSBHO" NO. 1003807

SCALE NONE WT SHEET 4 OF 4

LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS3	E1	TB1-5
	E2	-15
	E3	-18
	E4	-19
	H1	-4
	H2	-10
	H3	-13
	F1	-3
	F2	-14
	F3	-17
	J1	-2
	J2	-9
	J3	-12
	M1	-1
	M2	-8
	K1	-7
	N1	-6
	N2	-11
	N3	TB1-16
	E5	TB2-10
	H4	-15
	H5	-9
	F4	-14
	F5	-5
	A1	-2
	J4	-13
	J5	-4
	B1	-1
	M3	-18
	M4	-12
	M5	-7
	K2	-16
	K3	-17
	K4	-8
	K5	-3
	N4	-11
	N5	-6
	G1	TB2-20
DS2	E3	TB1-38
	E1	-25
	E2	-35
	E4	-35
	H1	-24
	H2	-30
	H3	-33
	F1	-23
	F2	-34
	F3	-37
	J1	-22
	J2	-29
	J3	-32
	M1	-21
	M2	-28
	K1	-27
	N1	-26
	N2	-31
	N3	TB1-36
	E5	TB2-30
	H4	-35
	H5	-29
	F4	-34
	F5	-25
	A1	-22
	J4	-33
	J5	-24
	B1	-21
	M3	-38
	M4	-32
	M5	-27
	K2	-36
	K3	-37
	K4	-28
	K5	-23
	N4	-31
	N5	-26
	G1	TB2-40

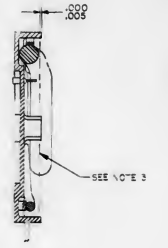
LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS1	E1	TB1-46
	E2	-51
	E3	-58
	E4	-59
	H1	-42
	H2	-50
	H3	-56
	F1	-45
	F2	-55
	F3	-57
	J1	-44
	J2	-53
	J3	-54
	M1	-41
	M2	-49
	K1	-48
	N1	-43
	N2	-47
	N3	TB1-52
	G1	TB2-60
	E5	-51
	H4	-57
	H5	-50
	F4	-58
	F5	-46
	A1	-42
	J4	-56
	J5	-45
	B1	-41
	M3	-53
	M4	-55
	M5	-48
	K2	-52
	K3	-54
	K4	-49
	K5	-44
	N4	-47
	N5	TB2-43
DS4	E1	TB1-68
	E2	-75
	H1	-67
	H2	-74
	F1	-66
	F2	-73
	J1	-65
	J2	-72
	M1	-64
	M2	-71
	K1	-63
	K2	-70
	N1	-62
	N2	TB1-61
	E3	TB2-75
	E4	-68
	H3	-74
	H4	-67
	F3	-73
	F4	-66
	J3	-72
	J4	-65
	M3	-71
	M4	-64
	K3	-70
	K4	-63
	N3	-61
	N4	TB2-62
	E6	TB1-69

LEAD ELECTRICAL		
REFERENCE DESIGNATION	LEAD IDENT	CONNECT TO
DS5	E1	TB1-85
	N1	-80
	F1	-84
	J1	-83
	M1	-79
	K1	-82
	N1	-78
	N2	TB1-77
	E2	TB2-85
	H2	-90
	F2	-84
	J2	-83
	M2	-79
	K2	-82
	S1	-77
	S2	-78
	G1	TB2-81
DS6	S1	TB1-88
	S2	TB2-88
	G2	TB2-86

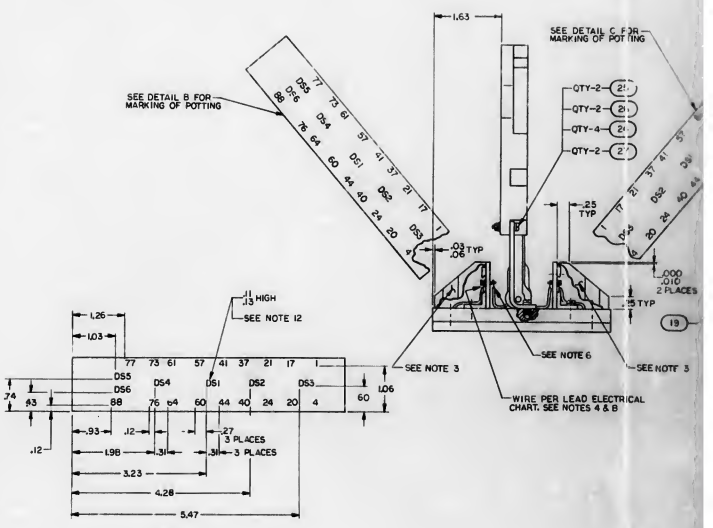
FROM	TO

COLOR CODE		
LEAD IDENT	STRIPE	BASE
E1		WHITE
F1	RED	
H1	ORANGE	
J1	GREEN	
K1	BLUE	
M1	BROWN	
N1	VIOLET	WHITE
E2	WHITE	RED
F2		
H2	ORANGE	
J2	GREEN	
K2	BLUE	
M2	BROWN	
N2	VIOLET	RED
E3	WHITE	ORANGE
F3	RED	
H3		
J3	GREEN	
K3	BLUE	
M3	BROWN	
N3	VIOLET	ORANGE
E4	WHITE	GREEN
F4	RED	
H4	ORANGE	
J4		
K4	BLUE	
M4	BROWN	
N4	VIOLET	GREEN
E5	WHITE	BLUE
F5	RED	
H5	ORANGE	
J5	GREEN	
K5		
M5	BROWN	
N5	VIOLET	BLUE
A1	RED	YELLOW
B1	BLACK	YELLOW
(DS5) S1		YELLOW
S2	GREEN	YELLOW
G1		BLACK
G2		BLACK
(DS6) S1	YELLOW BAND	
S2	RED BAND	
E6		BLACK

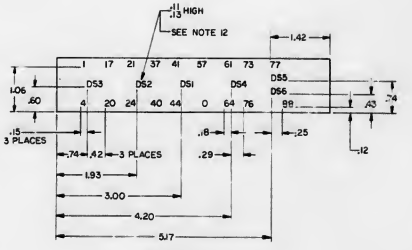
NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. BOND FIND NO. 8,9 & 10 TO FIND NO. 3 PER ND1002004, TYPE II
3. ENCAPSULATE PER ND1002217
4. SOLDER FIND NO. 4 TO FIND NO. 1, FIND NO. 5 TO FIND NO. 1 & FIND NO. 2, LEADS FROM FIND NO. 9, 10, & 11 TO FIND NO. 6 & FIND NO. 7 PER ND1002071 USING SOLDER PER ND1002075
5. NO GAP PERMISSIBLE BETWEEN RESPECTIVE LIGHT DSI THRU DS5 AND SURFACES A, B, C, D, E & F
6. SOLDER FIND NO. 4 TO FIND NO. 6 AND FIND NO. 7 PER ND1002071 EXCEPT SOLDER TO BE 555 PER QQ-S-571
7. WIRING PER ND1002032
8. DRESS AND TRIM AT ASSEMBLY, STRIP ALL LEADS .19 AND TIN TYP FIND NO. 6, 8, 9, 10, & 11
9. AR DENOTES AS REQUIRED
10. LACE HARNESS TO RETAINING STRAPS WITH FIND NO. 29 AS REQUIRED
11. ENCAPSULATE INDICATED AREA PER ND1002009 METHOD E WITH PRIMER
12. MARK WHITE CHARACTERS AS SHOWN PER ND1002019, TYPE II, CLASS 1, USING AS INK JO633B DILUTED WITH 40 ±5% (BY WEIGHT) TOLUOL PER FED-SPEC TT-T-571



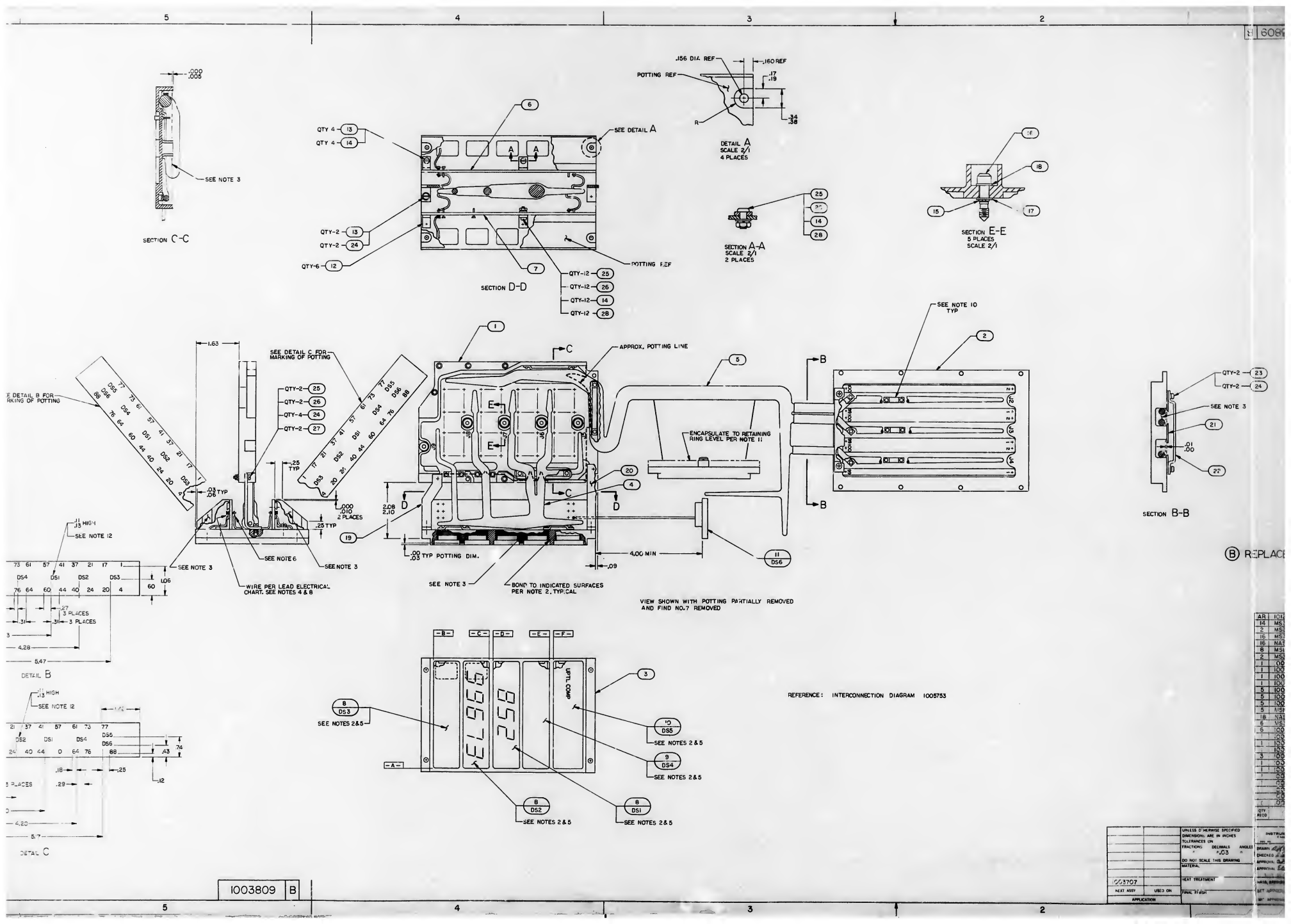
SECTION C-C



DETAIL B

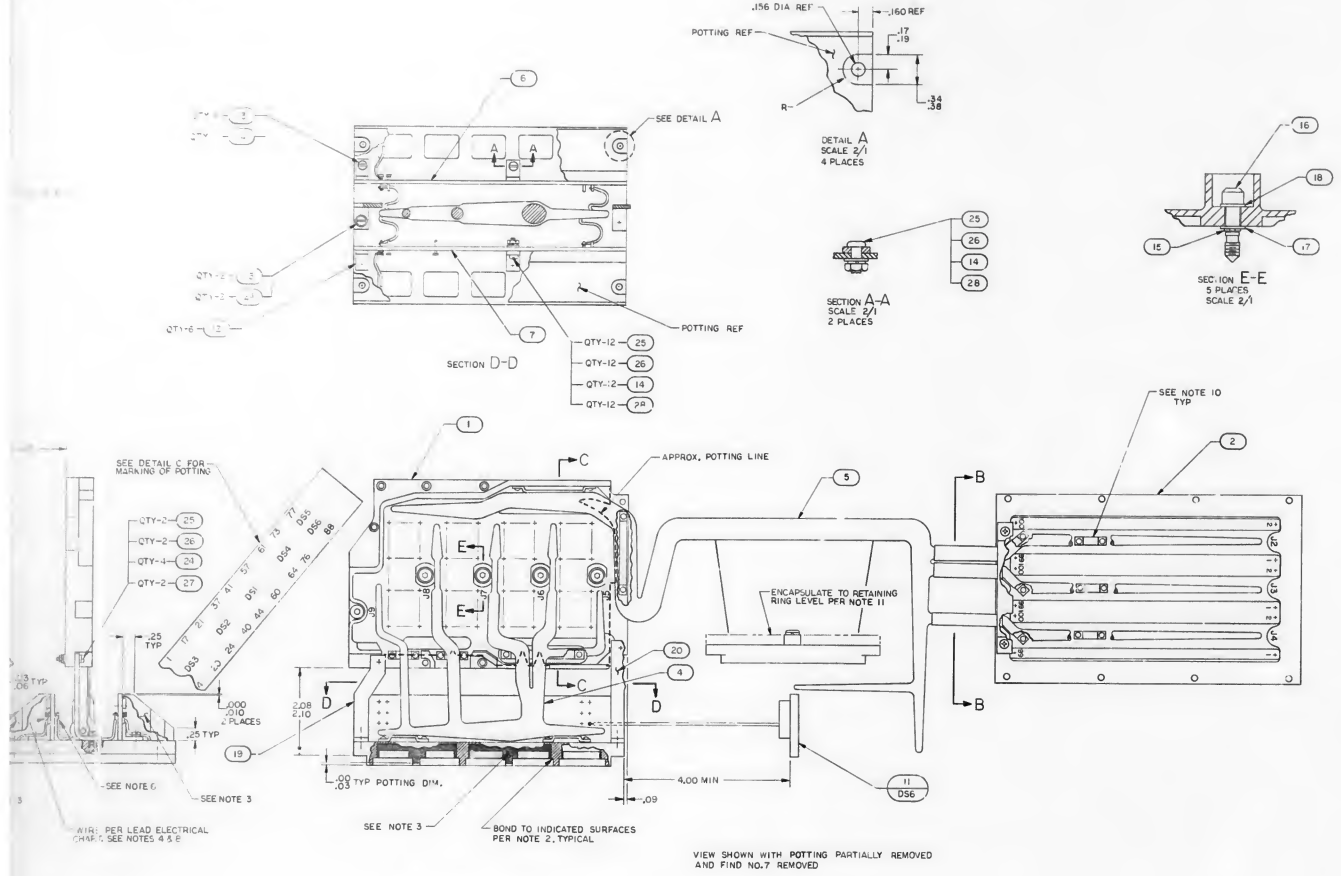


DETAIL C

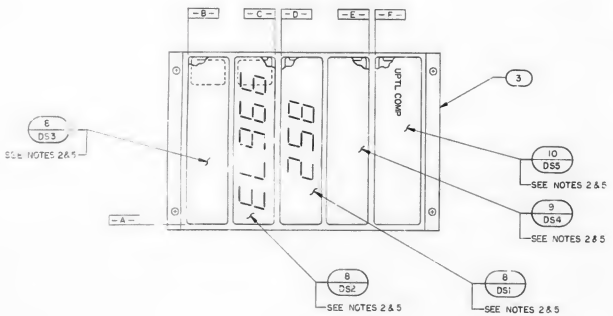

SECTION C-C
SEE NOTE 3
SECTION D-D
QTY 4 13
QTY 4 14
SEE DETAIL A
QTY-2 13
QTY-2 24
QTY-6 12
QTY-12 25
QTY-12 26
QTY-12 14
QTY-12 28
POTTING REF
.156 DIA REF
.160 REF
POTTING REF
.17
.19
.34
.36
DETAIL A
SCALE 2/1
4 PLACES
SECTION A-A
SCALE 2/1
2 PLACES
SECTION E-E
5 PLACES
SCALE 2/1
SEE DETAIL B FOR MARKING OF POTTING
1.63
SEE DETAIL C FOR MARKING OF POTTING
QTY-2 25
QTY-2 26
QTY-4 24
QTY-2 27
.25 TYP
.03 .06 TYP
.000 .010 2 PLACES
.25 TYP
.13 HIGH
SEE NOTE 12
SEE NOTE 3
SEE NOTE 6
SEE NOTE 3
WIRE PER LEAD ELECTRICAL CHART. SEE NOTES 4 & 8
APPROX. POTTING LINE
2.08
2.10
.00 TYP POTTING DIM.
.03
SEE NOTE 3
BOND TO INDICATED SURFACES PER NOTE 2, TYPICAL
ENCAPSULATE TO RETAINING RING LEVEL PER NOTE 11
4.00 MIN
.09
SEE NOTE 10 TYP
VIEW SHOWN WITH POTTING PARTIALLY REMOVED AND FIND NO.7 REMOVED
DETAIL B
.13 HIGH
SEE NOTE 12
3 PLACES
3 PLACES
4.28
5.47
DETAIL C
QTY-2 23
QTY-2 24
SEE NOTE 3
21
.01 .00
22
SECTION B-B
8 DS3
SEE NOTES 2&5
10 DS5
SEE NOTES 2&5
9 DS4
SEE NOTES 2&5
8 DS2
SEE NOTES 2&5
8 DS1
SEE NOTES 2&5
UP/TL COMP
REFERENCE: INTERCONNECTION DIAGRAM 1005753
(B) REPLACE
1003809 B
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .X ±.03 .XX
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
003707
NEXT ASSY USED ON
APPLICATION

1003809 B

REVISIONS			
ZONE	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGES PER TDRR 20558		



(B) REPLACES REV A WITH CHANGES



REFERENCE: INTERCONNECTION DIAGRAM 1005753

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
AR	1012507-003	TAPE, LACING	29
14	MS35233-15	SCREW, PAN HEAD	28
2	MS35233-18	SCREW, PAN HEAD	27
16	MS35337-78	WASHER, LOCK	26
16	NAS617C4	NUT, HEX, PLAIN	25
8	MS15795-803	WASHER, FLAT	24
2	MS35216-13	SCREW, PAN HEAD	23
1	1004630	BRACKET, CABLE SUPPORT	22
1	1004562	PLATE, CABLE SUPPORT	21
1	1004817	BRACKET, E/L FRAME	20
1	1004818	BRACKET, CONN PLATE	19
5	1004546-1	WASHER, FLAT	18
5	1004546-3	WASHER, FLAT	17
5	1004579-1	SCREW, JACKING	15
5	MS16633-4015	RING, RETAINING	15
18	NAS620C4	WASHER, FLAT	14
6	MS35233-13	SCREW, PAN HEAD	13
6	1004801	BRACKET, TERMINAL BOARD	12
1	1003804	INDICATOR E/L ASSY (ALARM)	11
1	1003801	INDICATOR E/L ASSY (PROGRAM)	10
1	1003802	INDICATOR E/L ASSY (VERB-NOUN)	9
3	1003803	INDICATOR E/L ASSY (REGISTER)	8
1	1003760	TERMINAL BOARD ASSY (BE)	7
1	1003759	TERMINAL BOARD ASSY (TB)	6
1	1003826-011	WIRING HARNESS, CABLE B	5
1	1003825-011	WIRING HARNESS, CABLE A	4
1	1004802	FRAME, E/L	3
1	1003547-011	CONN PL, WIRE WRAP ASSY (DSKY)	2
1	1003810-011	CONN PL, WIRE WRAP ASSY (RELAY)	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .03 DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINISH	M.I.T. INSTRUMENTATION LAB Cambridge, Mass. DRAWN [illegible] DATE 8 Aug 68 CHECKED [illegible] APPROVED [illegible] APPROVED [illegible] NASA APPROVAL MIT APPROVAL [illegible] MIT APPROVAL	MANNED SPACECRAFT CENTER HOUSTON TEXAS E/L FRAME & HARNESS ASSY AGC DSKY MAIN 100 SERIES CODE IDENT NO 80230 SIZE J NASA DRAWING NO 1003809 SCALE 1/1 WT SHEET 1 OF 1
1003707 NEXT ASSY USED ON APPLICATION		

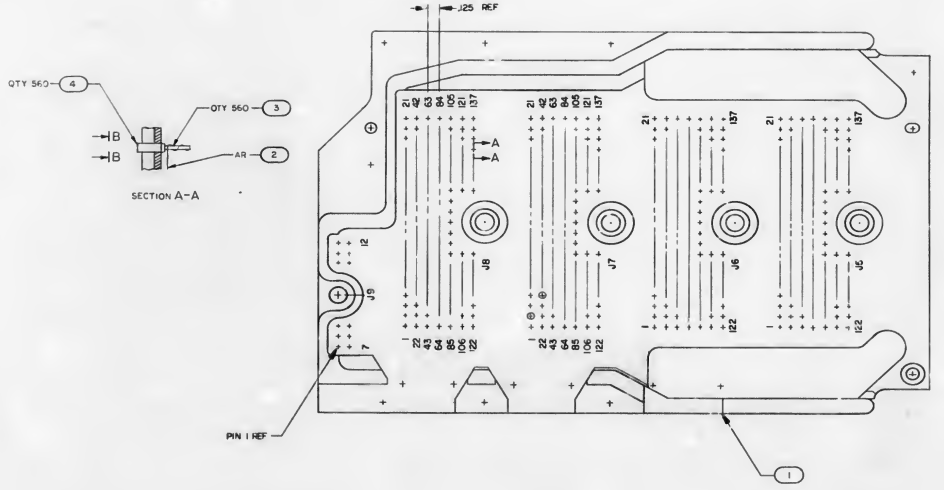
1003809 B

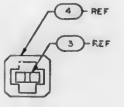
WIRING LEGEND				
FROM	COLOR	AWG	FIND NO.	TO
J5-102	WHITE	30	2	J5-83
J5-83				J5-80
J5 80				J5-56
J5-56				J5-53
J5-53				J5-71
J5-71				J5-11
J5-11				J5-35
J5-35				J6-102
J6-102				J6-83
J6-83				J6-80
J6-80				J6-56
J6-56				J6-53
J6-53				J6-71
J6-71				J6-46
J6-46				J6-11
J6-11				J6-35
J6-35				J7-102
J7-102				J7-83
J7-83				J7-80
J7-80				J7-35
J7-35				J7-11
J7-11				J7-56
J7-56				J7-71
J7-71				J7-27
J7-27				J8-71
J8-71				J8-56
J8-56				J8-11
J8-11				J8-35
J8-35				J8-80
J8-80				J8-83
J8-83				J9-10
J5-46				J8-103
J8-105				J7-16
J7-16				J7-82
J7-82				J7-105
J7-105				J6-16
J6-16				J6-82
J6-82				J6-105
J6-105				J5-16
J5-16				J5-82
J5-82				J5-105
J5-105				J5-85
J7-68				J7-109
J7-109				J7-24
*J7-7				J7-68
*J5-104				J6-104
*J5-39				J6-39
*J5-58				J6-58
*J5-99				J6-99
*J5-62				J6-62
*J5-14				J6-14
*J5-38				J7-38
J7-38				J7-5
*J5-77				J7-77
J7-77				J8-9
*J5-12				J6-12
*J5-74				J6-74
*J5-30				J7-30
J7-30				J6-5
*J5-34				J6-34
J6-34				J7-34
J7-34				J8-34
*J5-75				J6-75
J6-75				J7-75
J7-75				J8-75
*J5-50				J6-50
*J5-8				J6-8
*J5-5				J5-45
J5-45				J7-45
*J6-91				J6-96
*J5-96				J5-91
*J5-65				J6-125
J6-125				J6-69
J6-69				J6-66
J6-66	WHITE	30	2	J6-25

* INDICATES WIREWRAP MUST BE ON FIRST LEVEL

WIRING LEGEND				
FROM	COLOR	AWG	FIND NO.	TO
J6-25	WHITE	30	2	J6-2
J6-2				J8-125
J8-125				J8-69
J8-69				J8-66
J8-66				J8-25
J8-25				J8-2
*J5-20				J7-20
J7-20				J7-R
*J5-26				J6-9
J6-9				J7-26
*J5-106				J6-122
J6-122				J7-106
*J7-127				J7-89
J7-89				J7-23
J7-23				J8-105
*J5-86				J6-124
J6-124				J6-109
J6-109				J6-68
J6-68				J6-24
J6-24				J6-7
J6-7				J8-124
J8-124				J8-109
J8-109				J8-68
J8-68				J8-24
J8-24				J6-7
*J5-9				J6-20
J6-20				J8-20
*J6-108				J6-38
J6-38				J8-38
*J6-77				J7-108
J7-108				J8-77
*J5-108				J6-30
J6-30				J8-30
*J6-26				J8-26
J8-26				J8-8
*J5-122				J6-106
J6-106				J8-106
*J5-136				J6-136
J6-136				J6-57
J6-57				J6-132
J6-132				J7-136
J7-136				J7-57
J7-57				J8-136
*J7-74				J8-74
*J7-13				J7-6
*J7-50				J8-50
*J7-8				J8-8
*J7-104				J8-104
*J5-134				J5-116
J5-116				J5-17
J5-17				J6-134
J6-134				J6-116
J6-116				J6-17
J6-17				J7-134
J7-134				J7-116
J7-116				J7-17
J7-17				J8-134
J8-134				J8-116
J8-116				J8-17
J8-17				J9-1
*J7-39				J8-32
*J7-59				J8-58
*J7-99				J8-99
*J7-14				J8-14
*J7-12				J8-12
*J5-114				J5-117
J5-117				J6-114
J6-114				J6-117
J6-117				J7-114
J7-114				J7-117
J7-117				J8-114
J8-114				J8-117
J8-117				J8-133
J8-133				J9-2
*J7-62	WHITE	30	2	J8-62

WIRING LEGEND				
FROM	COLOR	AWG	FIND NO.	TO
J5-94	WHITE	30	2	J5-113
J7-94				J7-113
J6-94				J8-94
J8-94				J8-40
J8-113				J8-81
*J7-28				J7-48
J7-48				J7-88
J7-88				J8-118
J8-118				J7-115
J7-115				J7-40
J7-40				J7-118
J7-118				J6-115
J6-115				J6-40
J6-40				J6-118
J6-118				J5-115
J5-115				J5-40
J5-40				J5-118
J5-118	WHITE	30	2	J5-87





VIEW B-B
SCALE 10/1
560 PLACES

NOTES

1. WIRE PER ND1002031
2. AR DENOTES AS REQUIRED
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
4. ROUTE WIRES PER 1004575

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
560	1006774	INSULATOR, WRAPOST FEMALE	4
560	1006781-4	CONTACT, WRAPOST FEMALE	3
AR	.06732	WIRE, ELECTRICAL	2
1	1004810	PLATE, CONN. RELAY HOUSING	1

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
		DO NOT SCALE THIS DRAWING	CONNECTOR PLATE WIRE WRAP ASSY., RELAY MODULE AGC DSKY MAIN 100 SERIES
		MATERIAL	
1003807		HEAT TREATMENT	
NEXT ASSY	USED ON	FINISH	
APPLICATION			

REV INSTRUMENTATION LAB CAMBRIDGE, MASS

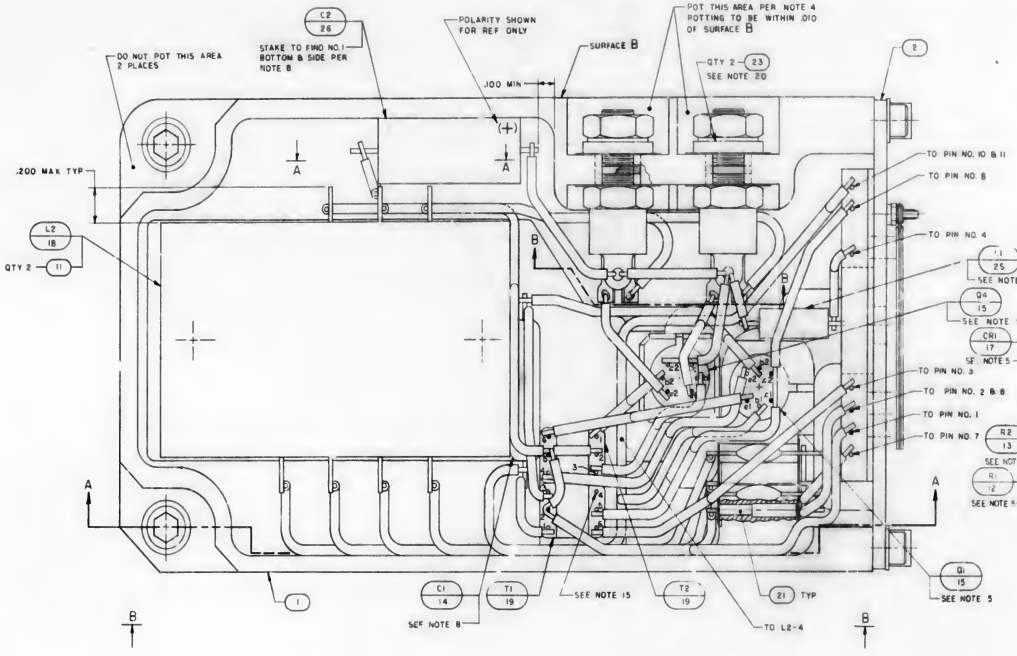
DRAWN J. Lloyd DATE 10/7/68
CHECKED J. Cooper 10/8/68
APPROVAL Sanderson 9/23/68
APPROVAL [illegible]

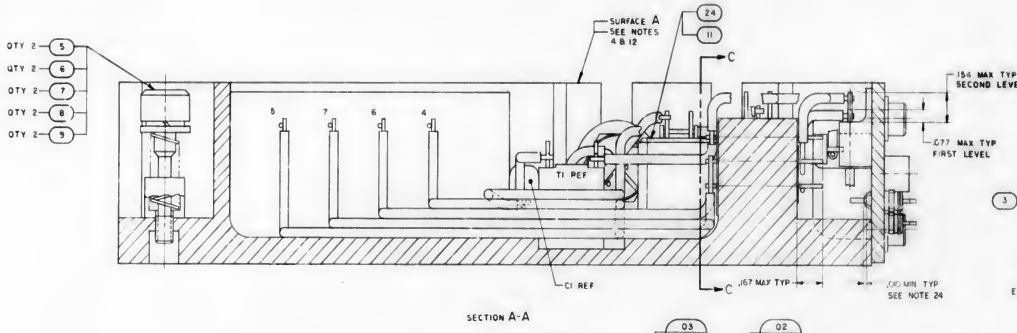
NASA APPROVAL [illegible]
M/T APPROVAL
QUAL APPROVAL [illegible]

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1003810

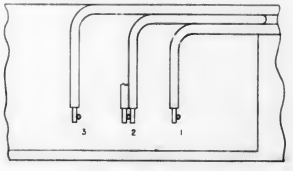
SCALE NONE | WT | SHEET 1 OF 1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TORR 17241 DR J. Brown CHK [illegible]	8/16/66	
B	REVISED PER TORR 20090 DR M. Kelly CHK [illegible]	8/31	

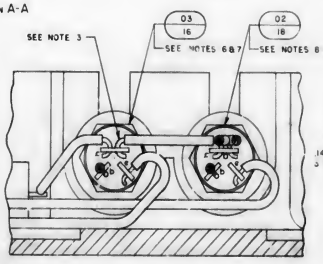




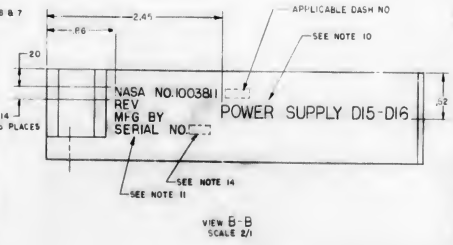
SECTION A-A



VIEW A-A



SECTION B-B



VIEW B-B
SCALE 2/1

CHART A		CHART B	
PART NO	VALUE	PART NO.	VALUE
1006750-19	300	1006750-41	2400
-22	390	-42	2700
-25	510	-43	3000
-27	620	-44	3300
-28	680	-45	3600
-29	750	-46	3900
-30	820	-47	4300
-31	910	1006750-48	4700
-32	1000		
-34	1200		
1006750-36	1500		

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. WELD PER NDI02-2005
3. SOLDER PER NDI002071
4. ENCAPSULATE PER NDI002002
5. STAKE PER NDI002009
6. MOUNTING TORQUE OF FIND NO.16 TO BE 8-15 IN-LBS
7. NEW MICA WASHERS TO BE INSTALLED EACH TIME FIND NO.13 IS DISASSEMBLED
8. BOND FIND NO. 18 & 14 TOGETHER & TO FIND NO.1, AND FIND NO.25 & 26 TO FIND NO.1 PER NDI002004, TYPE I OR TYPE II
9. *BLACK DOT DENOTES LEAD TO CUT FOR SECOND LEVEL WIRING
10. MARK .135 HIGH WHITE PER NDI002019 AND NDI002122 TYPE II, CLASS 2, USING MARKING INK 1006271-1
11. MARK .280 HIGH WHITE PER NDI002019 AND NDI002122 TYPE II, CLASS 2, USING MARKING INK 1006271-1
12. POTTING TO BE WITHIN .010 OF SURFACE A
13. ALL VIEWS SHOWN WITH POTTING REMOVED FOR CLARITY
14. SERIALIZE PER NDI002023
15. PIN 4 TO BE CUT .010 TO .015 FROM SURFACE OF T1 ONLY
16. K DENOTES CATHODE SIDE OF DIODE
17. # DENOTES LENGTH IN FEET
18. VALUE OF FIND NO.13 TO BE DETERMINED AND INSTALLED AT UNIT TEST. SELECT R2 FROM CHART A
19. VALUE OF FIND NO.12 TO BE DETERMINED AND INSTALLED AT UNIT TEST. SELECT R1 FROM CHART B
20. REPLACE FLAT WASHER SUPPLIED WITH FIND NO. 18, WITH FIND NO 23
21. RESISTOR VALUES ARE EXPRESSED IN OHMS UNLESS OTHERWISE SPECIFIED
22. ~~FIND NO. 28 TO BE PRESS FITTED TO DIM. SHOWN~~
23. ~~FILL WITH THERMALLY CONDUCTIVE RESIN PER ND1003885, DO NOT ENCAPSULATE AFTER FILLING~~
24. SEAL AROUND CONTACT PIN & INSULATORS PER ND1002004, TYPE II
25. AR DENOTES AS REQUIRED
26. WORKMANSHIP, FABRICATION, AND INSPECTION REQUIREMENTS PER ND1002069

REF	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
	1005756	[illegible] MATERIAL, ELECTRICAL	
1	1004633	RECEPTACLE, TEST POINT	28
1	1004632	GASKET	27
1	1004795-134	CAPACITOR, FIXED, TANTALUM	26
1	1010406-7	COIL, RF CHOKE	25
1	1004820-011	HOLDER, COMPONENT	24
2	MS15795-808	WASHER, FLAT	23
4	MS15795-803	WASHER, FLAT	22
* 5.0	1006776-22	INSULATION SLEEVING	21
* 5.0	1006757-13	WIRE, ELECTRICAL	20
2	1010291-4	TRANSFORMER, AUDIO	19
1	1006726	SATURABLE REACTOR	18
4	1006751	SEMICONDUCTOR DEVICE, DIODE	17
2	1010268-2	TRANSISTOR, 2 AMP SILICON	16
2	1010376-1	TRANSISTOR, SILICON	15
1	1006793-19	CAPACITOR, FIXED, GLASS DIELECTRIC	14
1	SEE NOTE 18	RESISTOR, FIXED FILM, 4 W	13
1	SEE NOTE 19	RESISTOR, FIXED FILM, 1/4 W	12
3	1010477-12	SCREW, FLAT	11
4	MS16995-9	SCREW, SOCKET HEAD	10
2	1004592	CUP, SPRING	9
2	MS35337-79	WASHER, LOCK	8
2	1004546-2	WASHER, FLAT	7
2	MS24585-32	SPRING, COIL	6
2	1004583	SCREW, CAPTIVE	5
1	1004595	INSULATOR, FRONT	4
1	1004821	INSULATOR, BACK	3
1	1003450	CONNECTOR PLATE ASSY	2
1	1004819-011	HOUSING	1

LIST OF MATERIALS

1003707			
1003708			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY | USED ON APPLICATION

MIT INSTRUMENTATION LAB Cambridge Mass
DRAWN [illegible] DATE 6-15-66
CHECKED [illegible] DATE 6-15-66
APPROVAL (ENGR) [illegible] DATE 6-15-66
APPROVAL (QUAL) [illegible] DATE 6-15-66
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

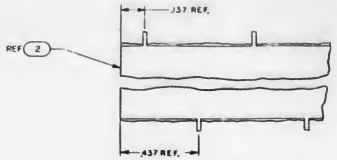
MANNED SPACECRAFT CENTER HOUSTON TEXAS

POWER SUPPLY ASSY AGC DSKY, NAV & MAIN 100 SERIES

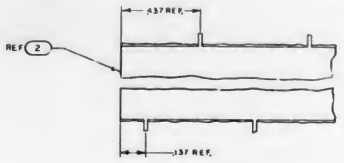
CODE IDENT NO	SIZE	NASA DRAWING NO
80230	J	1003811

SCALE 4/1 WT SHEET 1 OF 1

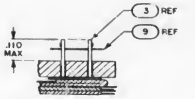
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 16353 DR CHK		
B	REVISED PER TDRR 18628 A DR CHK		
C	REVISED PER TDRR 20964 DR CHK		



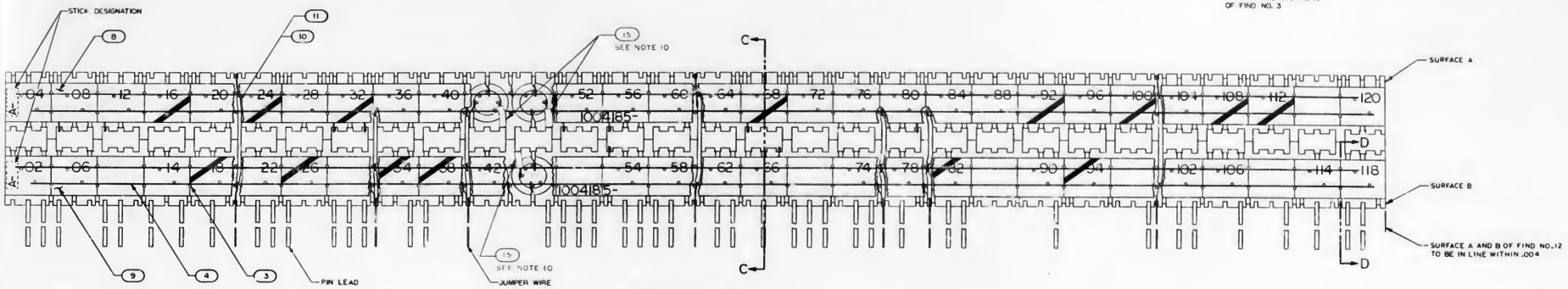
SECTION A-A



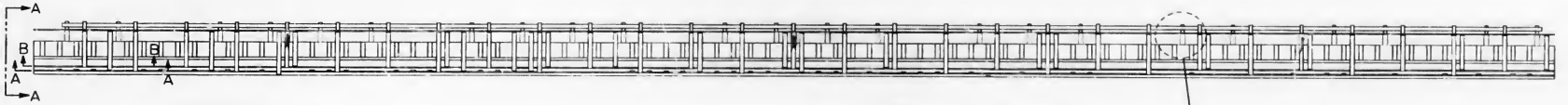
SECTION B-B

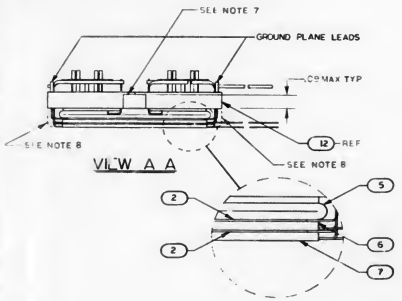


SECTION D-D
TYP FOR ALL LOCATIONS OF FIND NO. 3

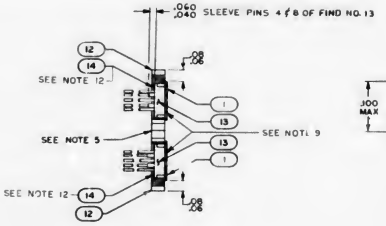


VIEWS SHOWN ARE OF NO SPECIFIC MODULE. JUMPER WIRES ARE TYPICAL

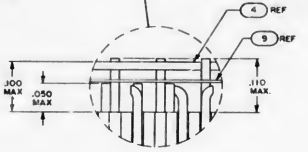




VIEW A A



SECTION C-C
FIND NO. 2 THRU 11 REMOVED FOR CLARITY
SCALE: NONE



NOTES:
1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. WELD PER ND1002005
3. A R DENOTES AS REQUIRED
4. ⊡ IN TABLE 1 SIGNIFIES FIND NO. 13 AND FIND NO. 14 TO BE OMITTED IN THIS POSITION
5. BOND HOUSING, FIND NO. 12, TOGETHER PER ND1002004, TYPE 1 OR 2 ORIENTING AS SHOWN
6. IDENTIFY WITH DRAWING NO. AND REVISION PER ND1002019
7. FILL CAVITY BETWEEN FIND NO. 12 PER ND1002009 METHOD B AS SHOWN
8. SEAL EDGE OF ASSY PER ND1002009 METHOD B
9. STAKE FIND NO. 13 TO FIND NO. 1 USING MIL-A-5092 TYPE II
10. SLEEVE LEADS TO TERMINALS OF FIND NO. 13 AS SHOWN, TYP ALL FIND NO. 13
~~11. CHECK INSULATION REQUIREMENTS FOR CLEARANCE LESS THAN .020 BETWEEN CONDUCTIVE MATERIALS. APPLY SOLDERING INSULATION TO ONE CONDUCTOR USING SCD 1006776 OR ND 1003004~~
12. CURE FIND NO. 14 TO FIND NO. 13 AT 190°F ± 5°F FOR 1/2 HOUR
13. WORKMANSHIP, FABRICATION, AND INSPECTION REQUIREMENTS PER ND1002069

QTY REQ.	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
AR	1006776-22	INSULATION, SLEEVING	15
CHART	1004851	INSULATOR	14
CHART	1004300	MICRO-NOR GATE (TO-47)	13
2	1004698	HOUSING, MICROLOGIC	12
AR	1006757-8	WIRE, ELECTRICAL .020 DIA	11
AR	1006776-21	INSULATION, SLEEVING	10
1	SEE CHART	INSULATOR, STICK	9
1	SEE CHART	INSULATOR, STICK	8
1	SEE CHART	.800 MATRIX ASSEMBLY (6)	7
1	SEE CHART	.800 MATRIX ASSEMBLY (4)	6
1	SEE CHART	1.400 MATRIX ASSEMBLY (2)	5
AR	1006757-7	WIRE ELECTRICAL NICKEL .005 X .020	4
AR	1015402	WIRE ELECTRICAL KOVAR	3
CHART	1004100	GROUND PLANE	2
AR	1006826-3	INSULATION TAPE, ELECTRICAL	1

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE MASS. DRAWN DATE CHECKED APPROVAL APPROVAL NASA APPROVAL MIT APPROVAL
		DO NOT SCALE THIS DRAWING	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
1003812		MATERIAL	MICRO-LOGIC MODULE SUB ASSEMBLY (TABULATED) (EVEN)
1003815		HEAT TREATMENT	CODE IDENT NO 80230 · SIZE E · DWG NO 1003813
NEXT ASSY	USED ON	FINAL FINISH	SCALE 4/1 · WT · SHEET 1 OF 2
APPLICATION			

REVISIONS							
ZONE	REV	DESCRIPTION	DES	CHKD	DATE	APP'D
	A	REVISED PER TDRR 16353 DR CHK				
	B	REVISED PER TDRR 18628A DR CHK				
	C	REVISED PER TDRR 20564 DR CHK				

TABLE I

TABLE INDICATES LOADING OF HOUSING MODULES (FIND NO. 12) WITH MICRO NOR GATES (FIND NO. 13), SEE NOTE 4

POSITION NO.	MODULE NO. A1-A16	A17	A18	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30-A31	A32	A33-A34	A35	A36	A37	A38
02																	X		
04										X					X				X
06																			
08					X	X	X												X
10	X																		
12			X																
14			X																
16	X																		
18	X					X			X								X		X
20																			
22																			
24																			
26						X													
28																			
30			X	X			X												
32																			
34																			
36						X													
38						X											X		X
40					X	X									X				
42																			
44																			
46						X			X										
48					X	X													
50	X			X	X	X	X	X											
52																			
54																			
56																	X		
58																	X		
60			X																
62			X		X												X		
64																			
66			X					X									X		
68															X				
70			X	X	X		X			X									
72																			
74					X												X		
76															X				
78					X														
80																			
82					X														
84																			
86			X		X		X												
88					X														
90								X											
92																			
94					X														
96						X	X												
98			X		X		X												
100																			
102					X							X							
104																			
106			X		X	X													
108																			
110				X	X		X												
112																	X		
114				X									X						
116						X	X										X		
118				X									X						
120																			

CHART I

MODULE NO.	INSULATOR FIND NO. 8	INSULATOR FIND NO. 9	MATRIX 2 FIND NO. 5	MATRIX 4 FIND NO. 6	MATRIX 6 FIND NO. 7	PART NO.	REV	SEE TABLE I FOR POSITION OF THESE COMPONENTS: QUANTITY OF FIND NO. 2	QUANTITY OF FIND NO. 13	QUANTITY OF FIND NO. 14
A1-A16	1004170-4	1004170-2	1003063-1	1003064-1		1003813-1	B	1	56	56
A17	1004173-4	1004173-2	1003063-7	1003064-13		1003813-2	B	1	60	60
A18	1004172-4	1004172-2	1003063-41	1003064-88		1003813-3	B	1	50	50
A21	1004186-4	1004186-2	1003063-33	1003064-65	1003064-96	1003813-4	B	2	54	54
A22	1004183-4	1004183-2	1003063-43	1003064-90		1003813-5	B	1	45	45
A23	1004175-4	1004175-2	1003063-11	1003064-57		1003813-6	B	1	49	49
A24	1004185-4	1004185-2	1003063-31	1003064-61	1003064-62	1003813-7	B	2	52	52
A25	1004184-4	1004184-2	1003063-29	1003064-21		1003813-8	B	1	57	57
A26	1004179-4	1004179-2	1003063-39	1003064-37		1003813-9	B	1	58	58
A27	1004174-4	1004174-2	1003063-45	1003064-17		1003813-10	B	1	58	58
A28	1004182-4	1004182-2	1003063-47	1003064-33		1003813-11	B	1	60	60
A29	1004826-4	1004826-2	1003063-51	1003064-97		1003813-12	B	1	59	59
A30-A31	1004178-4	1004178-2	1003063-17	1003064-53		1003813-13	B	1	58	58
A32	1004176-4	1004176-2	1003063-13	1003064-25		1003813-14	B	1	58	58
A33-A34	1004177-4	1004177-2	1003063-15	1003064-29		1003813-15	B	1	58	58
A35	1004171-4	1004171-2	1003063-3	1003064-5		1003813-16	B	1	58	58
A36	1004187-4	1004187-2	1003063-35	1003064-77		1003813-17	B	1	53	53
A37	1004180-4	1004180-2	1003063-53	1003064-99		1003813-18	C	1	60	60
A38	1004181-4	1004181-2	1003063-44	1003064-91		1003813-19	B	1	57	57

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	SPARE NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY USED ON APPLICATION

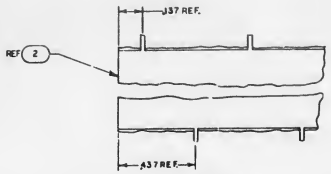
M.I.T. INSTRUMENTATION LAB Cambridge, Mass.
DRAWN DATE 8/19/64
CHECKED DATE 8/20/64
APPROVAL
APPROVAL
NASA APPROVAL 9/12-69
M.I.T. APPROVAL 9/24/69

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

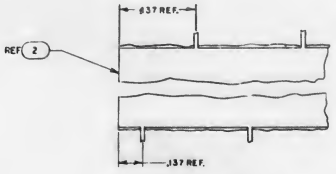
MICRO-LOGIC MODULE SUB ASSEMBLY (TABULATED)(EVEN)

CODE IDENT NO. 80230 | SIZE E | NASA DRAWING NO. 1003813
SCALE | WT. | SHEET 2 OF 2

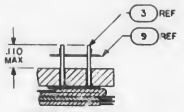
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 16353 DR [illegible] CHK [illegible]	2/15/67	[illegible]
B	REVISED PER TDRR 1862BA DR [illegible] CHK [illegible]	4/15/67	[illegible]



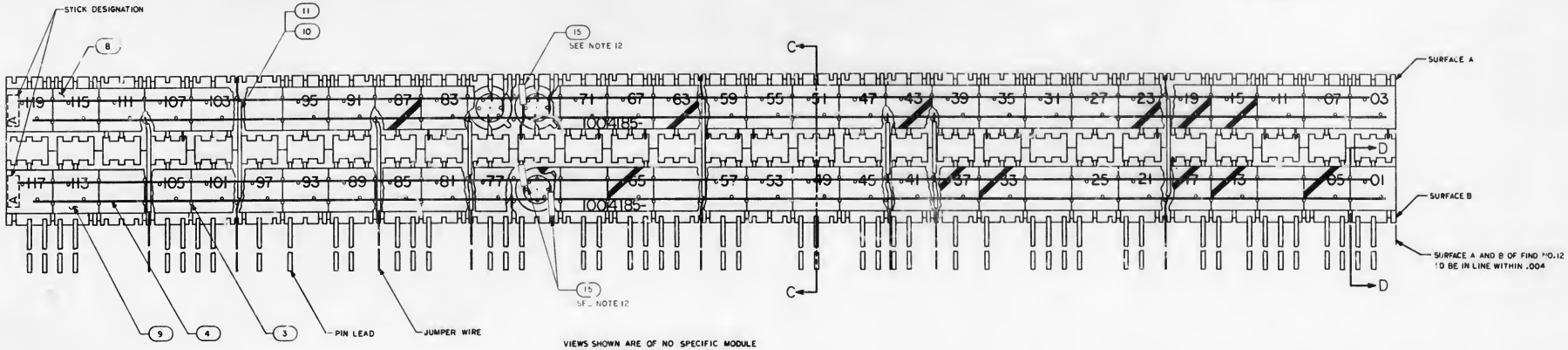
SECTION A-A



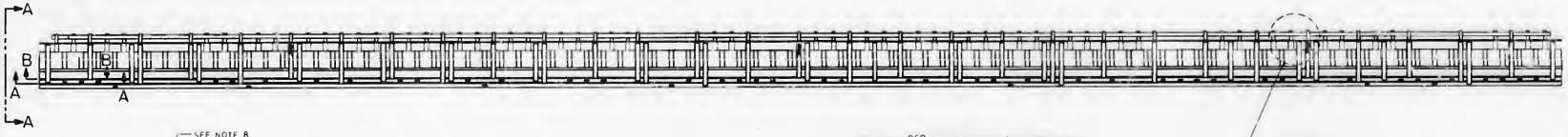
SECTION B-B

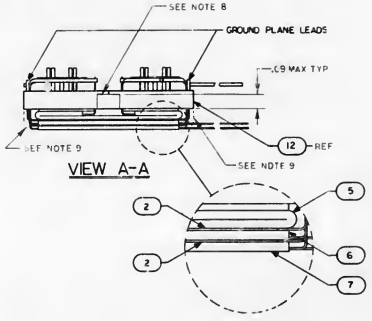


SECTION D-D
TYP FOR ALL LOCATIONS OF FIND NO. 3

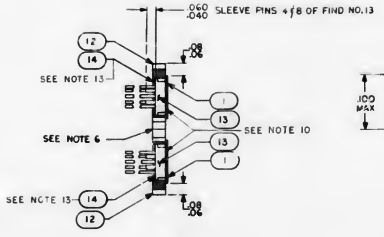


VIEWS SHOWN ARE OF NO SPECIFIC MODULE
JUMPER WIRES ARE TYPICAL OF MODULES
A1 THRU A16.

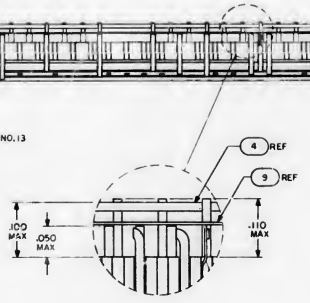




VIEW A-A



SECTION C-C
FIND NOS 2 THRU 11
REMOVED FOR CLARITY
SCALE: NONE



NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. WELD PER NDI002005
3. AR DENOTES AS REQUIRED
4. CUT 3V BUSS BETWEEN GATES 87 AND 83
5. ⊡ IN TABLE SIGNIFIES FIND NO.13 AND FIND NO.14 TO BE OMITTED IN THIS POSITION
6. BOND HOUSINGS, FIND NO. 12 TOGETHER PER NDI002004, TYPE II OR V ORIENTING AS SHOWN
7. IDENTIFY WITH DRAWING NO. AND REVISION PER NDI002019
8. FILL CAVITIES BETWEEN FIND NO.12 PER NDI002009 METHOD B AS SHOWN
9. SEAL EDGES OF ASSY PER NDI002008 METHOD B
10. STAKE FIND NO.13 TO FIND NO.1 USING MIL-A-5092 TYPE II
~~11. GENERAL INSULATION REQUIREMENTS FOR CLEARANCE LESS THAN .020 BETWEEN CONDUCTIVE MATERIALS, APPLY .10 MIN. INSULATION TO ONE CONDUCTOR USING SCD 1006776 OR NDI002004~~
12. SLEEVE LEADS TO TERMINALS OF FIND NO.13 AS SHOWN, TYP ALL FIND NO.13
13. CURE FIND NO.14 TO FIND NO. 13 AT 190°F ± 5°F FOR 1/2 HOUR
14. WORKMANSHIP, FABRICATION, AND INSPECTION REQUIREMENTS PER NDI002069

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
AR	1006776-22	INSULATION, SLEEVING	15
REF SCHEM	1004[illegible]	INSULATOR	14
REF SCHEM	1004300	MICRO-NOR GATE (TO-47)	13
2	1004658	HOUSING, MICROLOGIC (TO-47)	12
AR	1006757-8	WIRE, ELECTRICAL .020 DIA	11
AR	1006776-21	INSULATION, SLEEVING	10
1	SEE CHART I	INSULATOR, STICK	9
1	SEE CHART I	INSULATOR, STICK	8
1	SEE CHART I	.800 MATRIX ASSEMBLY (7)	7
1	SEE CHART I	.800 MATRIX ASSEMBLY (5)	6
1	SEE CHART I	1400 MATRIX ASSEMBLY (5)	5
AR	1006757-7	WIRE, ELECTRICAL NICKEL .005 X .020	4
AR	1015402	WIRE, ELECTRICAL KOVAR	3
REF SCHEM	1004100	GROUND PLANE	2
AR	1006826-3	INSULATION TAPE, ELECTRICAL	1

LIST OF MATERIALS

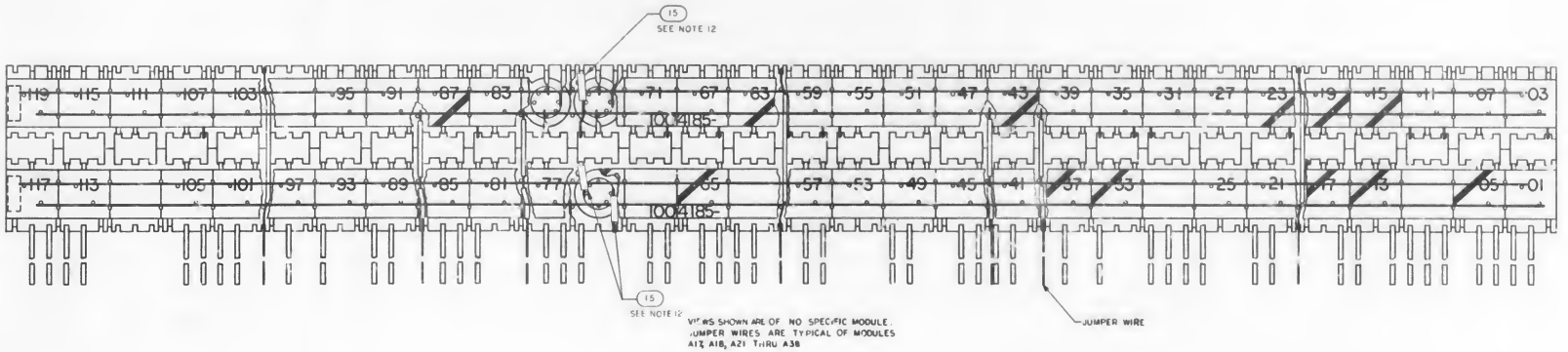
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	BIT INSTRUMENTATION LAB Cambridge, Mass.
		DO NOT SCALE THIS DRAWING	DRAWN [illegible] DATE 2/6/67
		MATERIAL	CHECKED [illegible]
			APPROVAL [illegible]
1003812		HEAT TREATMENT	NASA APPROVAL [illegible]
1003815			MIT APPROVAL [illegible]
NEXT ASSY	USED ON	FINISH	
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

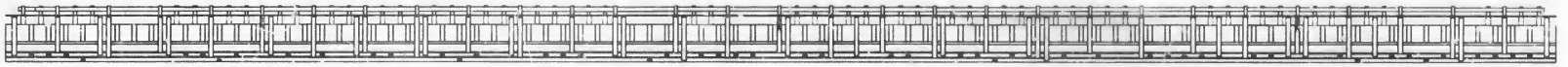
MICRO LOGIC MODULE SUB ASSEMBLY (ODD) (TABULATED)

CODE IDENT NO	SIZE	NASA DRAWING NO
[illegible]	E	1003814
SCALE 4/1	WT	SHEET 1 OF 3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 16355 CH-1 CHK		
B	REVISED PER TDRR 18628 L DR CHK		



VIEWS SHOWN ARE OF NO SPECIFIC MODULE.
JUMPER WIRES ARE TYPICAL OF MODULES
A1% A1B, A21 THRU A38



QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL		IBM INSTRUMENTATION LAB Kenilworth, Illinois DRAWN CHECKED APPROVAL APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
NEXT ASSY	USED ON	HEAT TREATMENT FINISH	NASA APPROVAL MIT APPROVAL
APPLICATION			CODE IDENT NO — SIZE E — NASA DRAWING NO 1003814 — SCALE — WT — SHEET 2 OF 3

MICRO LOGIC MODULE
SUB ASSEMBLY (ODD)
(TABULATED)

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 16353 DR [illegible] CHK [illegible]	8/20/64	[illegible]
B	REVISED PER TDRR 18628 A DR [illegible] CHK [illegible]	1/26/65	[illegible]

TABLE I

TABLE INDICATES LOADING OF HOUSING MODULES (FIND NO.12) WITH MICRO NOR GATES (FIND NO.13) SEE NOTE 5

MODULE NO.	A1-A16	A17	A18	A21	A22	A23	A24	A25	A26	A27	A28	A29	A30-A31	A32	A33-A34	A35	A36	A37	A38
POSITION NO. 01						X								X				X	
03						X		X											
05						X													
07			X			X	X					X							
09						X													
11						X													
13						X													
15									X										
17																			
19												X							
21		X				X									X				
23																			
25			X																
27																			
29						X	X					X		X					
31																			
33						X													
35						X													
37						X													
39						X													
41						X						X							
43															X				
45																			
47																			
49			X														X		
51												X							
53																			
55																			
57																			
59																			
61							X												
63																			
65																			
67																			
69		X	X		X		X												
71																			
73		X				X			X		X								
75																	X		
77																X			
79						X									X				
81						X													
83																			
85						X													
87						X													
89		X		X		X											X		
91																			
93		X									X								
95																			
97											X								
99							X												
101											X								
103														X			X		
105													X						
107						X													
109			X				X				X			X		X			
101											X								
113				X							X	X		X					
115																			
117											X			X					
119				X															

CHART I

MODULE NO.	INSULATOR FIND NO.8	INSULATOR FIND NO.9	MATRIX 3 FIND NO.5	MATRIX 5 FIND NO.6	MATRIX 7 FIND NO.7	PART NO.	REV	QUANTITY OF FIND NO.2	SEE TABLE I FOR POSITION OF THESE COMPONENTS: QUANTITY OF FIND NO.13	QUANTITY OF FIND NO.14
A1-A16	1004170-3	1004170-1	1003063-2	1003064-3		1003814-1	B	1	60	60
A17	1004173-3	1004173-1	1003063-9	1003064-92		1003814-2	B	1	55	55
A18	1004172-3	1004172-1	1003063-42	1003064-89		1003814-3	B	1	35	35
A21	1004186-3	1004186-5	1003063-49	1003064-95	1003064-68	1003814-4	B	2	57	57
A22	1004183-3	1004183-1	1003063-28	1003064-55	1003064-56	1003814-5	B	2	59	59
A23	1004175-3	1004175-1	1003063-12	1003064-59		1003814-6	B	1	41	41
A24	1004185-3	1004185-1	1003063-32	1003064-63	1003064-64	1003814-7	B	2	54	54
A25	1004184-3	1004184-1	1003063-30	1003064-23		1003814-8	B	1	59	59
A26	1004179-3	1004179-1	1003063-20	1003064-39		1003814-9	B	1	58	58
A27	1004174-3	1004174-1	1003063-46	1003064-19		1003814-10	B	1	60	60
A28	1004182-3	1004182-1	1003063-48	1003064-94		1003814-11	B	1	53	53
A29	1004826-5	1004826-1	1003063-52	1003064-98		1003814-12	B	1	54	54
A30-A31	1004178-3	1004178-1	1003063-18	1003064-35		1003814-13	B	1	59	59
A32	1004176-3	1004176-1	1003063-14	1003064-27		1003814-14	B	1	52	52
A33-A34	1004177-3	1004177-1	1003063-16	1003064-31		1003814-15	B	1	57	57
A35	1004171-3	1004171-1	1003063-4	1003064-7		1003814-16	B	1	59	59
A36	1004187-3	1004187-1	1003063-40	1003064-78		1003814-17	B	1	56	56
A37	1004180-3	1004180-1	1003063-22	1003064-76		1003814-18	B	1	59	59
A38	1004181-3	1004181-1	1003063-24	1003064-47		1003814-19	B	1	59	59

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE BY TECHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .X .XX .XXX

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

NEXT ASSY | USED ON

APPLICATION

MIT INSTRUMENTATION LAB Cambridge, Mass.

DRAWN [illegible] DATE 8/20/64

CHECKED [illegible] DATE 8/20/64

APPROVAL [illegible]

APPROVAL [illegible]

NASA APPROVAL [illegible] 8-20-64

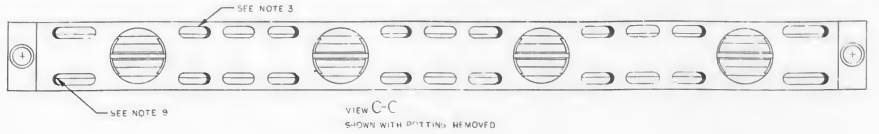
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

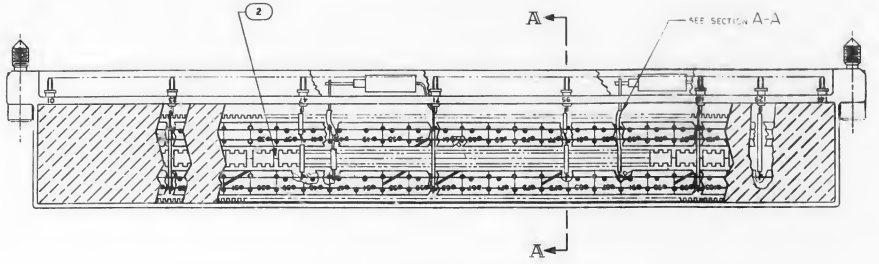
MICRO LOGIC MODULE SUB ASSEMBLY (ODD) (TABULATED)

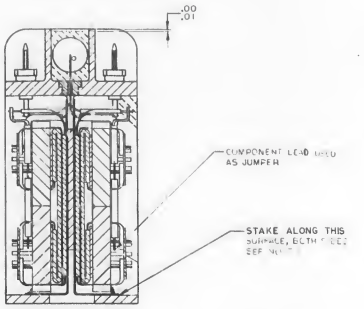
CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1003814

SCALE | WT | SHEET 3 OF 3

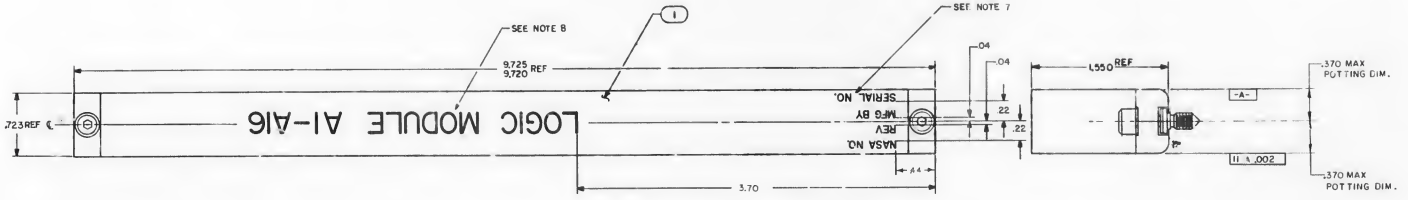


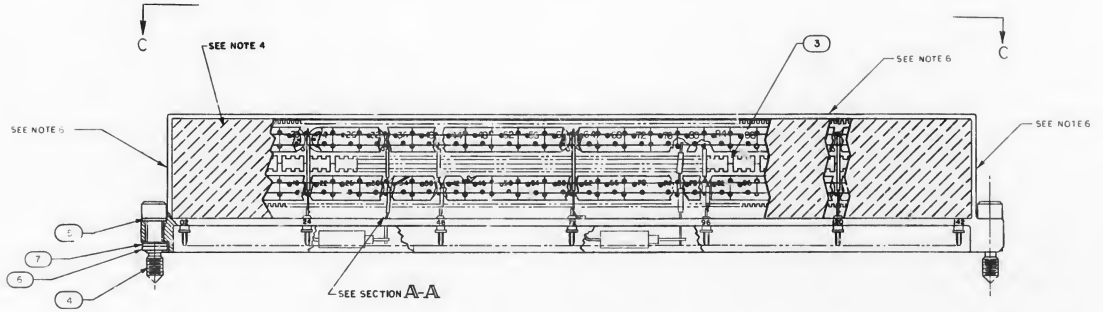
VIEW C-C
SHOWN WITH POTTING REMOVED

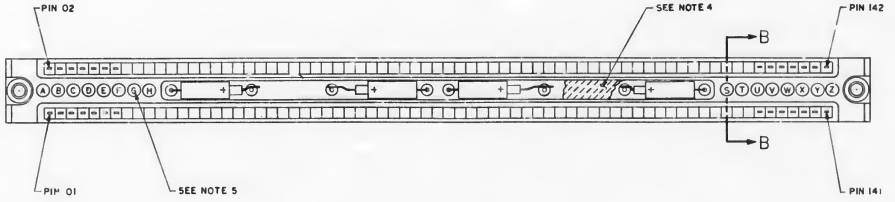


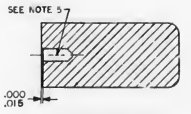


SECTION A-A
SCALE 4:1









SECTION B-B

NOTES:
1. INTERPRET DWG IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. WELD PER ND 1002005
3. POTTING MATERIAL - SLOTS AND HOLES TO BE .005 ABOVE FLUSH TO .010 BELOW FLUSH
4. ENCAPSULATE WITH POLYURETHANE FOAM PER ND 1002002 (BLACK)
5. FILL KEYING POSITIONS INDICATED BY CHART WITH THERMALLY CONDUCTIVE EPOXY RESIN PER ND1002183
6. SPRAY COAT TO SURFACE AND ENDS PER ND 1002004 FLAT BLACK
7. MARK .093 HIGH WHITE PER ND1002019 AND ND1002122 TYPE II CLASS 1, SERIALIZE PER ND 1002023, USING MARKING INK 1006271-1
8. MARK .125 HIGH WHITE PER ND1002019 AND ND1002122 TYPE II CLASS 1, USING MARKING INK 1006271-1
9. STAKE FIND NO. 2 & 3 TO FIND NO. 1 PER ND 1002004, FLOW STAKING COMPOUND PARTIALLY INTO SLOTS

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
2	1004546-3	WASHER, FLAT	7
2	MS16633-4015	RING, RETAINING, EXTERNAL "E"	6
2	1004546-1	WASHER, FLAT	5
2	1004579-1	SCREW, JACKING	4
1	1003813-1	MICRO LOGIC MODULE, SUB-ASSY (EVEN)	3
1	1003814-1	MICRO LOGIC MODULE, SUB-ASSY (ODD)	2
1	1003110	HEADER HOUSING ASSEMBLY	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± .05 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

1003700
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
Cambridge, Mass.
DRAWN W.H. Ryan DATE 12-26-64
CHECKED C.W. Mathews DATE 12-26-64
APPROVAL
APPROVAL P.C. Hoffman 12-26-64
NASA APPROVAL W.D. Petty DATE 12-26-64
MIT APPROVAL [signature] DATE 12-26-64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC MODULE ASSY
NO. A1-A16

CODE IDENT NO —— | SIZE E | NASA DRAWING NO 1003815
SCALE 2/1 | WT | SHEET 1 OF 2

PART NO.	REV	EVEN	ODD	REF FLOW	REF WIRING	KEY POSITIONS
1003812-1	—	1003813-1	1003814-1	1006540	1006120	ADEFTUVY

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY USED ON
APPLICATION

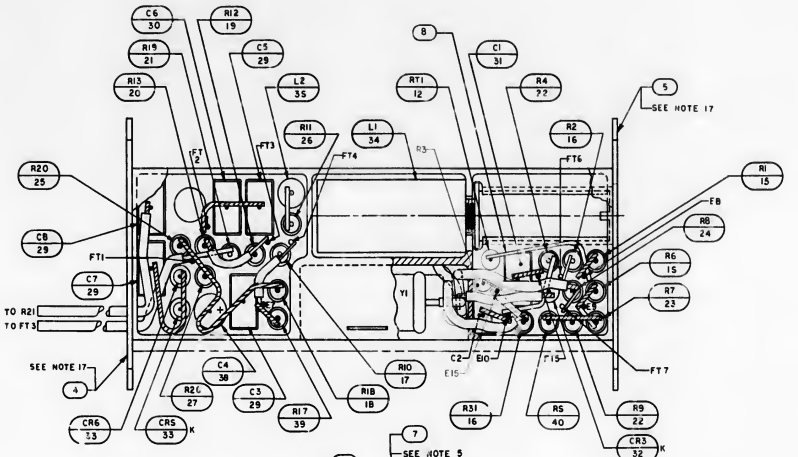
MIT INSTRUMENTATION LAB
Cambridge Mass
DRAWN [illegible] DATE 12/16/68
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 12-29-69
MIT APPROVAL [illegible]

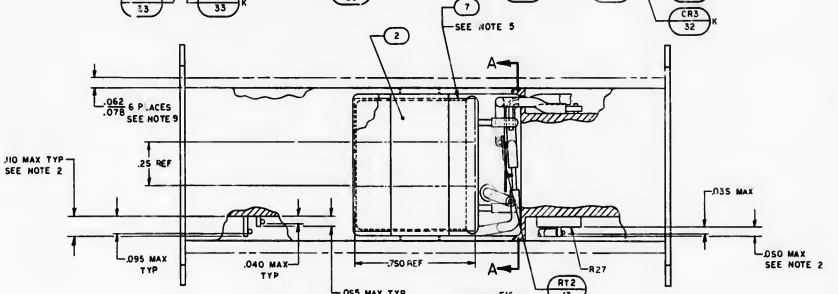
MANNED SPACECRAFT CENTER
HOUSTON TEXAS

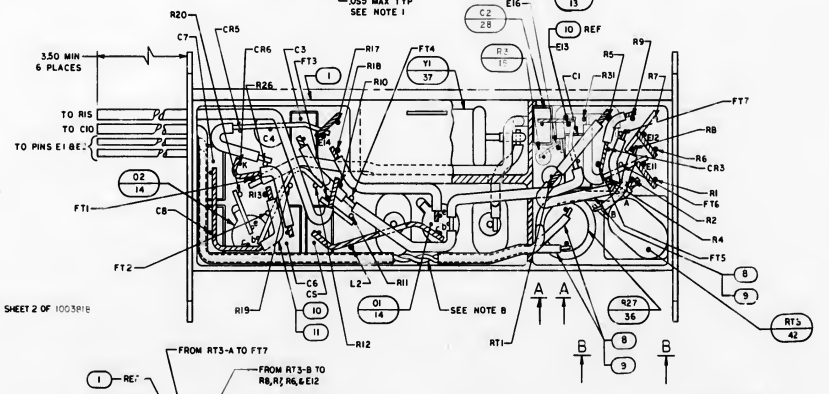
LOGIC MODULE ASSY
NO. A1-A16

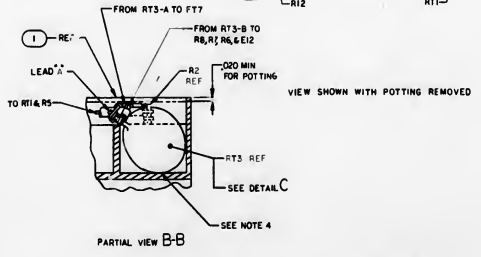
CODE IDENT NO | SIZE E | NASA DRAWING NO 1003815
SCALE | WT | SHEET 2 OF 2

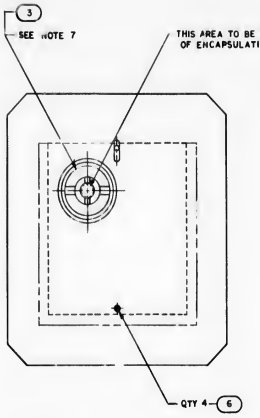
REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TCRA 18939 DR CHK'D APPROVED		

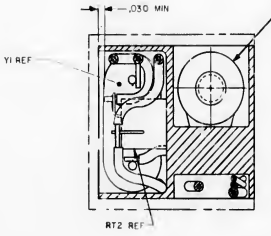




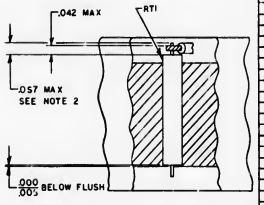




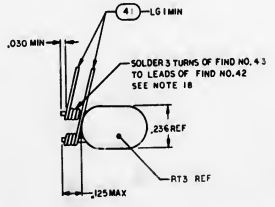




SECTION A-A



VIEW A-A



DETAIL C

NOTES
1. WHITE DOT INDICATES LEAD TO BE CUT FOR FIRST LEVEL WIRING
2. BLACK DOT INDICATES LEAD TO BE CUT TO DIMENSION SHOWN FOR SECOND LEVEL WIRING
3. WIRING STANDARDS FOR WELDED UNITS IN ACCORDANCE WITH ND1002005
4. STAKE ALL FEED THROUGHS AND ALL COMPONENTS EXCEPT FIND NO.31 AND FIND NO.37 PER ND1002009
5. OVERLAP ENDS OF FIND NO. 7 APPROXIMATELY .25 INCH AT CRYSTAL SURFACES CLOSEST TO FIND NO. 2
6. IDENTIFY WITH NASA DWG. NO. PER ND1002019
7. REMOVE AND DISCARD EXISTING NUT ON FIND NO. 34 AND REPLACE WITH FIND NO. 3
8. TWIST LEADS AS SHOWN 4 TIMES PER INCH
9. ENCAPSULATE CAVITIES OF FIND NO. 1 TO DIMENSION SHOWN USING RTV11 PER ND1002C09
10. AR DENOTES AS REQUIRED
11. K DENOTES CATHODE SIDE OF DIODE
12. THESE PARTS TO BE PART OF KIT ASSEMBLY DWG. NO. 1003538 AND NOMINAL VALUES TO BE SELECTED FROM SHEET 2 OF 1003818
13. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
14. SOLDER PER ND10 2071
15. TAPE, ALUMINUM BACKED ADHESIVE PER MIL-T-11231 .765/.735 WIDE
16. WHEN THE VALUE OF RB IS 0 OHMS USE .020 DIA NICHELL WIRE, FIND NO. 10
17. USE FIND NO.4 AND FIND NO.5 TO FIND NO.1 PER ND1002004
18. WORKMANSHIP, FABRICATION, AND INSPECTION REQUIREMENTS PER ND1C02069

ITEM	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	1006140	SCHEMATIC	REF
1	1006231	THERMISTOR	42
AR	1006757-24	WIRE, ELECTRICAL .010 DIA	41
1	SEE NOTE 12	RESISTOR, FIXED FILM	40
1	SEE NOTE 12	RESISTOR, FIXED, FILM	39
1	1006755-31	CAPACITOR, FIXED, TANTALUM	38
1	SEE NOTE 12	CRYSTAL UNIT, QUARTZ	37
1	1006714	RESISTOR, FIXED, WW	36
1	1010406-12	COIL, RF, CHOKE	35
1	1006846	COIL, RF, VARIABLE	34
2	1006751	SEMICONDUCTOR DEVICE, DIODE	33
1	SEE NOTE 12	SEMICONDUCTOR DEVICE, VAR CAP	32
1	SEE NOTE 12	CAPACITOR, FIXED	31
1	1006793-83	CAPACITOR, FIXED	30
4	1006793-87	CAPACITOR, FIXED	29
1	SEE NOTE 12	CAPACITOR, FIXED	28
1	1006750-56	RESISTOR, FIXED, FILM	27
1	1006750-39	RESISTOR, FIXED, FILM	26
1	1006750-1	RESISTOR, FIXED, FILM	25
1	SEE NOTE 12	RESISTOR, FIXED, FILM	24
1	SEE NOTE 12	RESISTOR, FIXED, FILM	23
2	SEE NOTE 12	RESISTOR, FIXED, FILM	22
1	1006750-60	RESISTOR, FIXED, FILM	21
1	1006750-42	RESISTOR, FIXED, FILM	20
1	1006750-82	RESISTOR, FIXED, FILM	19
1	1006750-6	RESISTOR, FIXED, FILM	18
1	1006750-82	RESISTOR, FIXED, FILM	17
2	SEE NOTE 12	RESISTOR, FIXED, FILM	16
3	SEE NOTE 12	RESISTOR, FIXED, FIL	15
2	1006752	TRANSISTOR, SILICON	14
1	SEE NOTE 12	THERMISTOR	13
1	1006715-1	THERMISTOR	12
AR	1006776-22	INSULATION, SLEEVING	11
AR	1006757-8	WIRE, ELECTRICAL, .020 DIA	10
AR	1006776-25	INSULATION SLEEVING	9
AR	1006757-12	WIRE, ELECTRICAL, .010 DIA	8
AR	SEE NOTE 15	TAPE, ADHESIVE, AL BACKED	7
4	1004544	PIN, GUIDE	6
1	1004555	END PLATE, RIGHT	5
1	1004558	END PLATE, LEFT	4
1	1004556	NUT, SLEEVE	3
1	1004557	SPRING, LEAF	2
1	1004840	HOLDER, COMPONENT	1

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES ± ± ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH	MIT INSTRUMENTATION LAB Cambridge, Mass. DRAWN RC Swindler DATE 10/6/67 CHECKED Edward Jones APPROVED Francis Lowe APPROVAL John Hall Jones MIT APPROVAL NASA APPROVAL
1003527			
NEXT ASSY	USED ON		
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPONENT ASSEMBLY
OSCILLATOR STAGE
AGC OSCILLATOR

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	J	1003818

SCALE 4/1 WT SHEET 1 OF 2

REVISIONS			
QTY	DESCRIPTION	DATE	APPROVED
A	REVISED PER TCRA 19969 DR G.Mann CHK J.P APPD J.M	7/16/67	

CHART A FIND NO.16 REF R31

DASH NO.	OHMS ±2%
1006750 - 54	10K
- 140	10.5K
- 57	11K
- 141	11.5K
- 58	12K
- 142	12.5K
- 59	13K
- 143	14K
- 60	15K
- 144	15.5K
- 61	16K
- 145	17K
- 62	18K
- 146	19K
- 63	20K
- 147	21K
- 64	22K
- 148	23K
- 65	24K
- 149	25.5K
- 66	27K
- 150	28.5K
- 67	30K
- 151	31.5K
- 68	33K
- 152	34.5K
- 69	36K
- 153	37.5K
- 70	39K
- 154	41K
1006750 - 71	43K

CHART B FIND NO.15 REF R1

DASH NO.	OHMS ±2%
1006750 - 52	6.8K
- 136	7.15K
- 53	7.5K
- 137	7.85K
- 54	8.2K
- 138	8.65K
- 55	9.1K
- 139	9.55K
- 56	10K
- 140	10.5K
- 57	11K
- 141	11.5K
- 58	12K
- 142	12.5K
- 59	13K
- 143	14K
- 60	15K
- 144	15.5K
- 61	16K
- 145	17K
- 62	18K
- 146	19K
- 63	20K
- 147	21K
1006750 - 64	22K

CHART C FIND NO.16 REF R2

DASH NO.	OHMS ±2%	DASH NO.	OHMS ±2%
1006750 - 56	10K	1006750 - 157	53.5K
- 140	10.5K	- 74	56K
- 57	11K	- 158	59K
- 141	11.5K	- 75	62K
- 58	12K	- 159	66K
- 142	12.5K	- 76	68K
- 59	13K	- 160	71.5K
- 143	14K	- 77	75K
- 60	15K	- 161	78.5K
- 144	15.5K	- 78	82K
- 61	16K	- 162	86.5K
- 145	17K	- 79	91K
- 62	18K	- 163	95.5K
- 146	19K	- 80	100K
- 63	20K	- 164	105K
- 147	21K	- 81	110K
- 64	22K	- 165	115K
- 148	23K	- 82	120K
- 65	24K	- 166	125K
- 149	25.5K	- 83	130K
- 66	27K	- 167	140K
- 150	28.5K	1006750 - 84	150K
- 67	30K		
- 151	31.5K		
- 68	33K		
- 152	34.5K		
- 69	36K		
- 153	37.5K		
- 70	39K		
- 154	41K		
- 71	43K		
- 155	45K		
- 72	47K		
- 156	49K		
1006750 - 73	51K		

CHART F FIND NO.39 REF R17

DASH NO.	OHMS ±2%
1006750 - 55	9.1K
- 56	10K
- 57	11K
- 58	12K
- 59	13K
1006750 - 60	15K

CHART H FIND NO.15 REF R12

DASH NO.	OHMS ±2%
1006712 - 1	500
1006712 - 2	1000
1006712 - 3	5000

CHART G FIND NO.28

DASH NO.	VALUE/UNIT
1006793 - 37	10
- 38	1
- 39	12
- 40	13
- 41	15
- 42	16
- 43	18
- 44	20
- 45	22
- 46	24
- 47	27
- 48	30
- 49	33
- 50	36
- 51	39
- 52	43
- 53	47
- 54	51
- 55	56
- 56	62
- 57	68
- 58	75
- 59	82
- 60	91
1006793 - 61	100

CHART D FIND NO.15 & FIND NO.23 REF R5 & R7

DASH NO.	OHMS ±2%	DASH NO.	OHMS ±2%	DASH NO.	OHMS ±2%
1006750 - 25	510	1006750 - 43	3K	1006750 - 143	14K
- 109	535	- 127	3.15K	- 60	15K
- 26	560	- 44	3.3K	- 144	15.5K
- 110	590	- 128	3.45K	- 61	16K
- 27	620	- 45	3.6K	- 145	17K
- 111	650	- 129	3.75K	- 62	18K
- 28	680	- 46	3.9K	- 146	19K
- 112	715	- 130	4.1K	- 63	20K
- 29	750	- 47	4.3K	- 147	21K
- 113	785	- 131	4.5K	- 64	22K
- 30	820	- 48	4.7K	- 148	23K
- 114	865	- 132	4.9K	- 65	24K
- 31	910	- 49	5.1K	- 149	25.5K
- 115	955	- 133	5.35K	- 66	27K
- 32	1K	- 50	5.6K	- 150	28.5K
- 116	1.05K	- 134	5.9K	- 67	30K
- 33	1.1K	- 51	6.2K	- 151	31.5K
- 117	1.15K	- 135	6.5K	- 68	33K
- 34	1.2K	- 52	6.8K	- 152	34.5K
- 118	1.25K	- 136	7.15K	- 69	36K
- 35	1.3K	- 53	7.5K	- 153	37.5K
- 119	1.4K	- 137	7.85K	- 70	39K
- 36	1.5K	- 54	8.2K	- 154	41K
- 120	1.55K	- 138	8.65K	- 71	43K
- 37	1.6K	- 55	9.1K	- 155	45K
- 121	1.7K	- 139	9.55K	- 72	47K
- 38	1.8K	- 56	10K	- 156	49K
- 122	1.9K	- 140	10.5K	- 73	51K
- 39	2.0K	- 57	11K	- 157	53.5K
- 123	2.1K	- 141	11.5K	- 74	56K
- 40	2.2K	- 58	12K	- 158	59K
- 124	2.3K	- 142	12.5K	1006750 - 75	62K
- 41	2.4K	1006750 - 59	13K		
- 125	2.55K				
- 42	2.7K				
1006750 - 126	2.85K				

CHART E FIND NO.15 & FIND NO.40 REF R6 & R5

DASH NO.	OHMS ±2%	DASH NO.	OHMS ±2%
1006750 - 32	1K	1006750 - 51	6.2K
- 116	1.05K	- 135	6.5K
- 33	1.1K	- 52	6.8K
- 117	1.15K	- 136	7.15K
- 34	1.2K	- 53	7.5K
- 118	1.25K	- 137	7.85K
- 35	1.3K	- 54	8.2K
- 119	1.4K	- 138	8.65K
- 36	1.5K	- 55	9.1K
- 120	1.55K	- 139	9.55K
- 37	1.6K	- 56	10K
- 121	1.7K	- 140	10.5K
- 38	1.8K	- 57	11K
- 122	1.9K	- 141	11.5K
- 39	2.0K	- 142	12K
- 123	2.1K	- 143	12.5K
- 40	2.2K	- 144	13K
- 124	2.3K	- 145	14K
- 41	2.4K	- 146	15K
- 125	2.55K	- 147	15.5K
- 42	2.7K	- 148	16K
- 126	2.85K	- 149	17K
- 43	3K	- 150	18K
- 127	3.15K	- 151	19K
- 44	3.3K	- 152	20K
- 128	3.45K	- 153	21K
- 45	3.6K	- 154	22K
- 129	3.75K	- 155	23K
- 46	3.9K	- 156	24K
- 130	4.1K	- 157	25.5K
- 47	4.3K	- 158	27K
- 131	4.5K	- 159	28.5K
- 48	4.7K	- 160	30K
- 132	4.9K	- 161	31.5K
- 49	5.1K	1006750 - 68	33K
- 133	5.35K		
- 50	5.6K		
1006750 - 134	5.9K		

CHART J FIND NO.24 REF R8

DASH NO.	OHMS ±2%	DASH NO.	OHMS ±2%
1006750 - 25	510	1006750 - 43	3K
- 109	535	- 127	3.15K
- 26	560	- 44	3.3K
- 110	590	- 128	3.45K
- 27	620	- 45	3.6K
- 111	650	- 129	3.75K
- 28	680	- 46	3.9K
- 112	715	- 130	4.1K
- 29	750	- 47	4.3K
- 113	785	- 131	4.5K
- 30	820	- 48	4.7K
- 114	865	- 132	4.9K
- 31	910	- 49	5.1K
- 115	955	- 133	5.35K
- 32	1K	- 50	5.6K
- 116	1.05K	- 134	5.9K
- 33	1.1K	- 51	6.2K
- 117	1.15K	- 135	6.5K
- 34	1.2K	- 52	6.8K
- 118	1.25K	- 136	7.15K
- 35	1.3K	- 53	7.5K
- 119	1.4K	- 137	7.85K
- 36	1.5K	- 54	8.2K
- 120	1.55K	- 138	8.65K
- 37	1.6K	- 55	9.1K
- 121	1.7K	- 139	9.55K
- 38	1.8K	- 56	10K
- 122	1.9K	- 140	10.5K
- 39	2.0K	- 57	11K
- 123	2.1K	- 141	11.5K
- 40	2.2K	1006750 - 58	12K
- 124	2.3K	1006757 - 8	0
- 41	2.4K		
- 125	2.55K		
- 42	2.7K		
1006750 - 126	2.85K		

Ⓐ THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
Cambridge, Mass.

DRAWN Percy 6-66 DATE 7-66
CHECKED T. Edwards 11 May 67
APPROVAL D. Arnold 11 MAY 67
APPROVAL Eric C. Hall 5 Jun 67

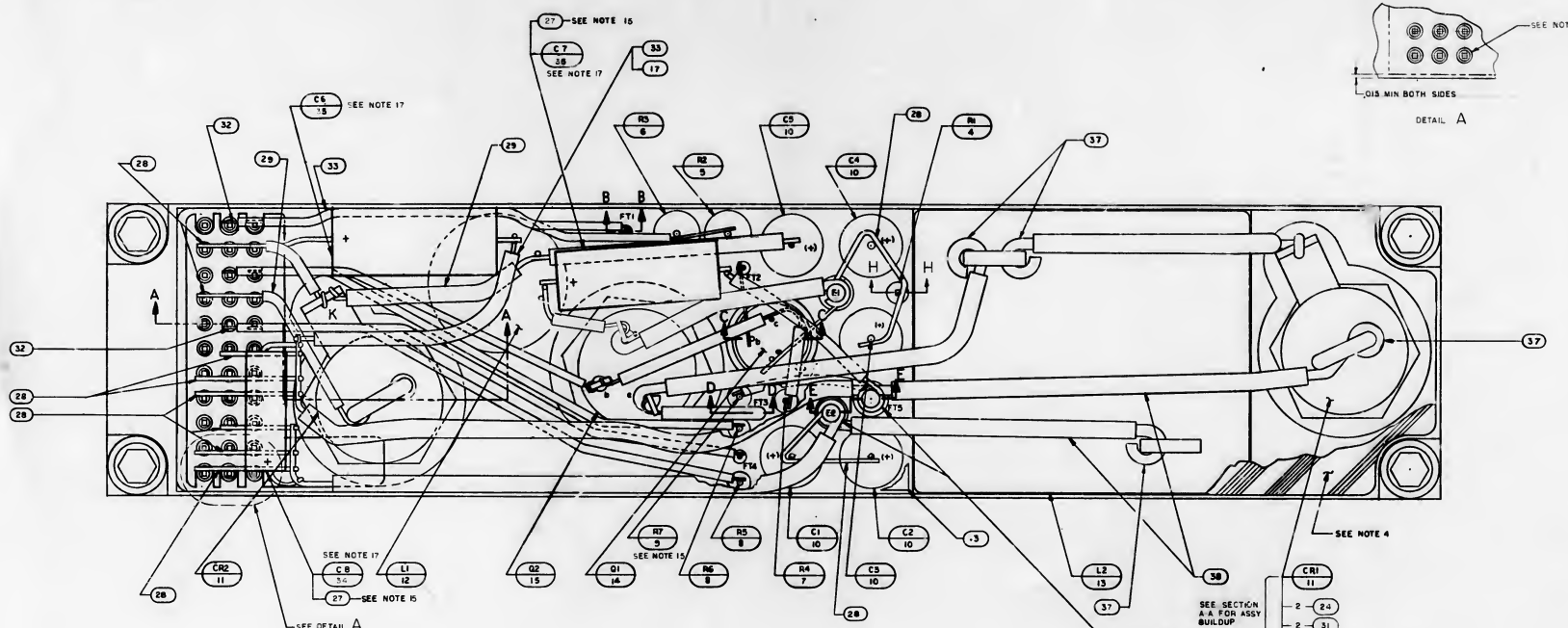
NASA APPROVAL Eric C. Hall 5 Jun 67
MIT APPROVAL Wayne A. Hoyt 6 Jun 67

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

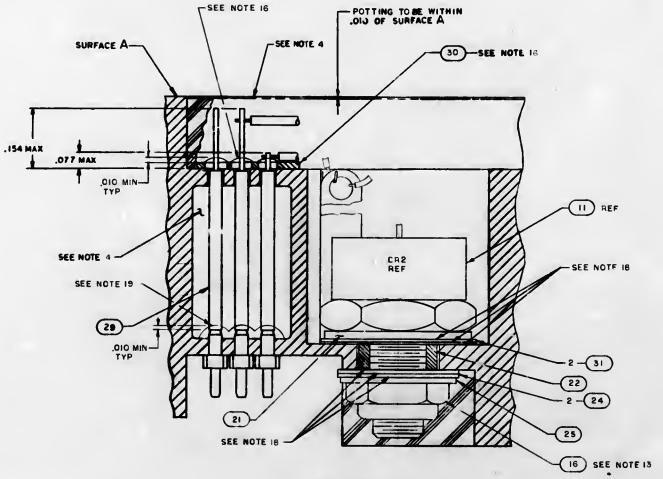
COMPONENT ASSEMBLY OSCILLATOR STAGE AGC OSCILLATOR

CODE IDENT NO. 80230 | SIZE J | NASA DRAWING NO. 1003818
SCALE NONE | WT | SHEET 2 OF 2

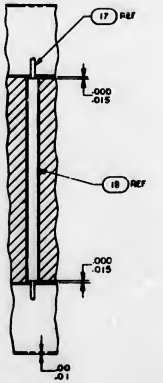
1003818 A



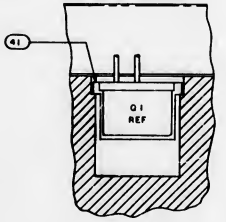
DETAIL A



SECTION A-A

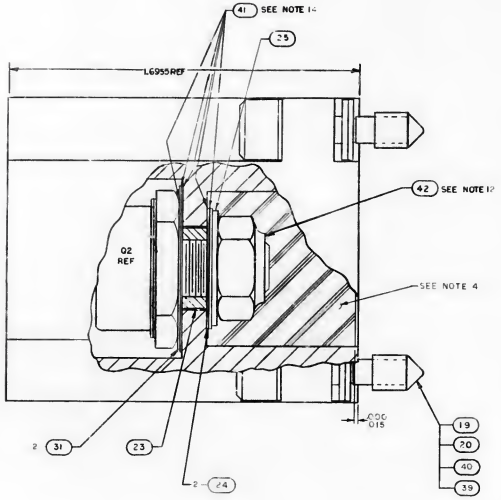


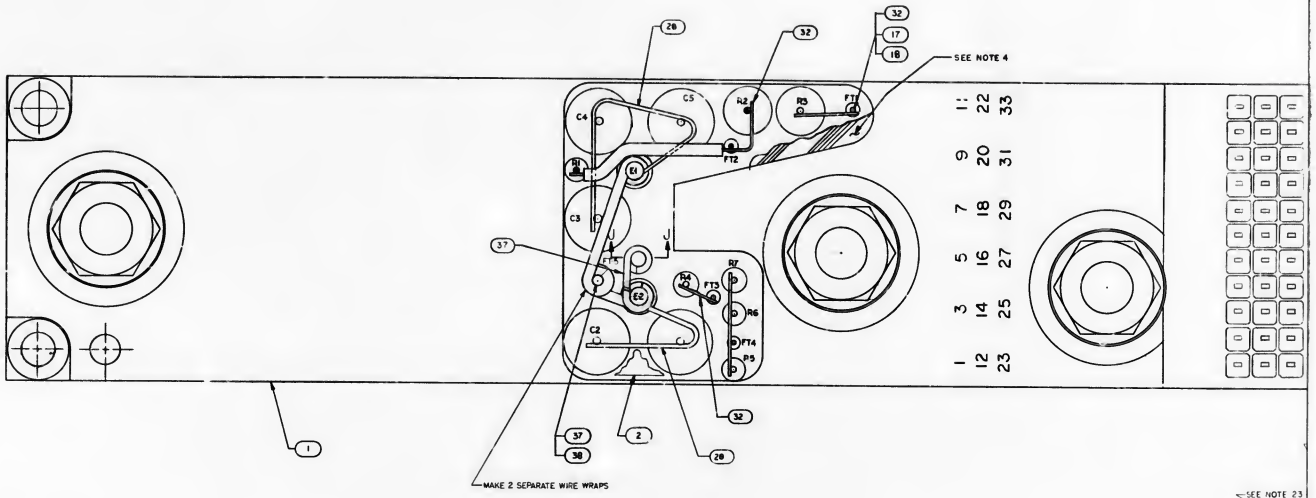
SECTION B-B

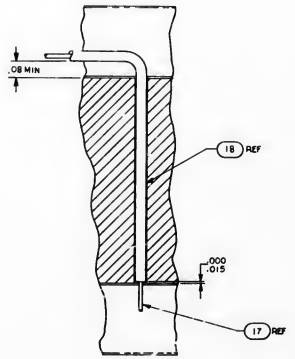


SECTION C-C

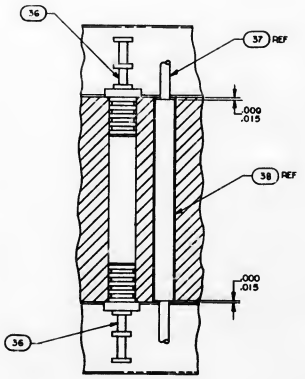
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ALL WELDED CONNECTIONS TO BE MADE PER NDIC02005
3. K INDICATES CATHODE SIDE OF DIODE
4. ENCAPSULATE MODULE PER NDIC02002 BLACK POLYURETHANE FOAM
5. MARK R5 C7 HIGH WHITE PER NDIC02019 AND NDI002122 TYPE II CLASS 1, USING MARKING INK IDD6271-1 SERIALIZE PER NDIC02023
6. MARK R1 R2 R3 R4 R6 R7 R8 C1 C2 C3 C4 C5 C6 C8 L1 L2 Q1 Q2 CR1 CR2 HIGH WHITE PER NDIC02019 AND NDI002122 TYPE II CLASS 1, USING MARKING INK IDD6271-1
7. [illegible] TYPE UNLESS OTHERWISE NOTED IS 12 THRU 4 PER NDIC02004
8. [illegible]
9. [illegible]
10. ● BLACK WIRE INDICATES LEAD TO BE CUT AT SECOND LEVEL
11. WHITE WIRE INDICATES LEAD TO BE CUT AT FIRST LEVEL
12. MOUNTING SCREWS PER 12-10-12 INCH POUNDS
13. [illegible] PER CR1 AND CR2 TO BE 25-35 INCH POUNDS
14. [illegible] AS SHOWN TO MOUNTING INTERFACES OF 12 B 41 BEFORE ASSEMBLY
15. [illegible] TO BE WRAPPED WITH COVE LAYER 1 FIND NO. 27
16. [illegible] FIND NO. 8 SEAL OPENINGS FOR FEED THRU
17. [illegible] PER NDIC02004 TYPE VI
18. [illegible] PER NDIC02004 TYPE VI
19. [illegible] SURFACES SHOWN ONLY TYP CR1 & CR2
20. [illegible] AND INSULATORS TO HEADER AS SHOWN
21. [illegible] TYPE VI
22. UNLESS OTHERWISE SPECIFIED ALL WIRING SHALL BE IN ACCORDANCE WITH NDI002069
23. BACKBONE TO BE RED USING MARKING INK IDD6271-9
24. MARK [illegible] HIGH WHITE CHARACTERS PER NDIC02019 AND NDI002122, TYPE II, CLASS 2, USING INK IDD6271-1 CENTRALIZE AS SHOWN
25. SEAL [illegible] AS SHOWN PER NDI002004 TYPE VI



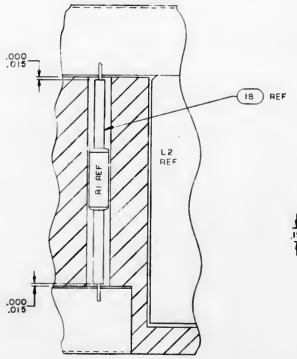




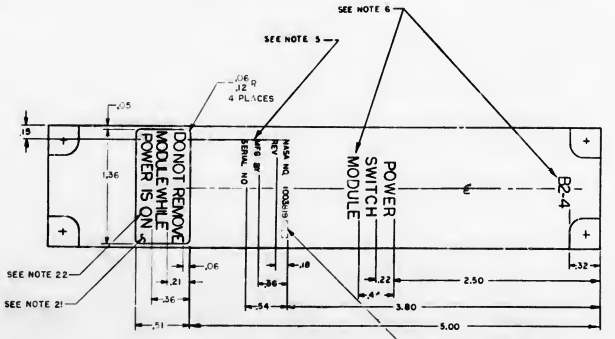
SECTION D-D



SECTION E-E



SECTION H-H
TYP ALL COMPONENTS EXCEPT TRANSISTORS



MARKING VIEW
SCALE 2/1

B 6182001

QTY	REVISIONS DESCRIPTION	DATE	APPROVAL
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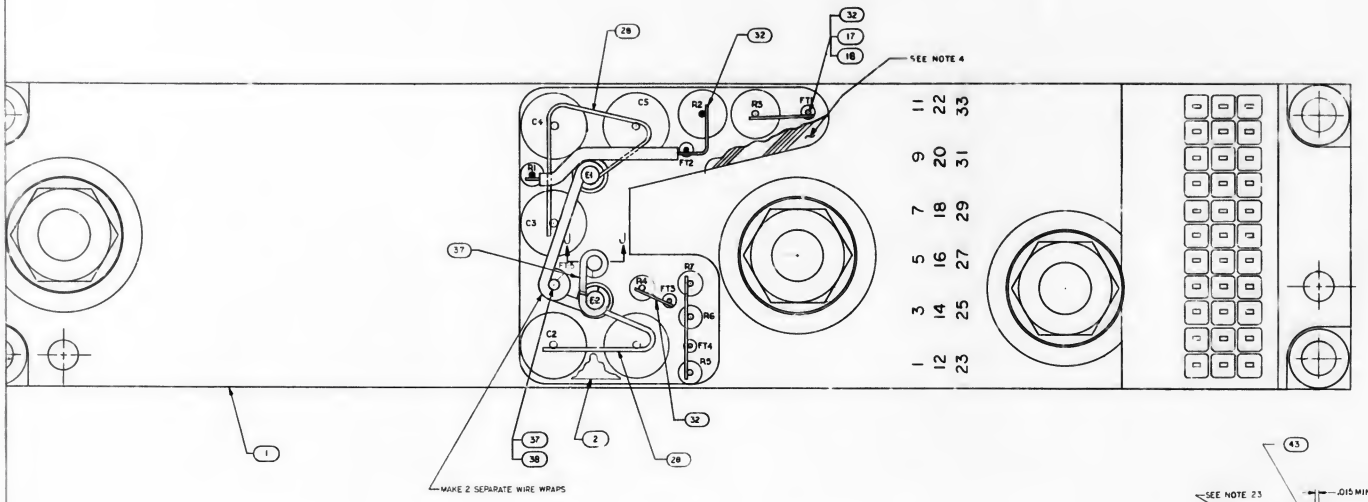
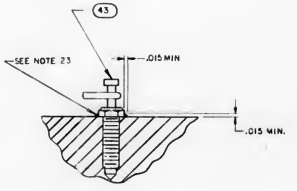
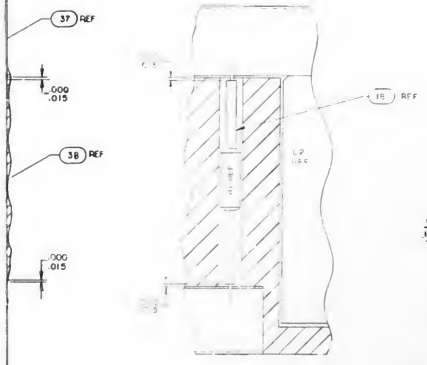
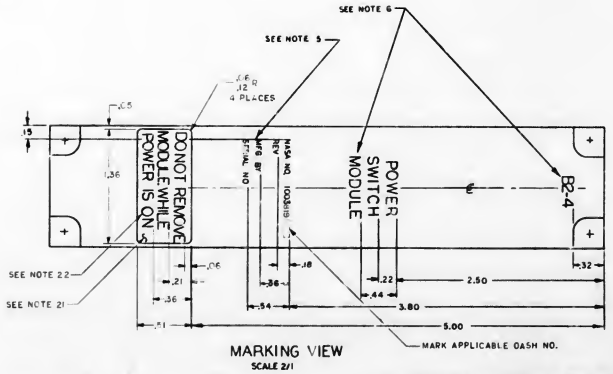
B	REVISED PER TDRR 20572 DRN CHK		





SECTION J-J





MARKING VIEW
SCALE 2/1

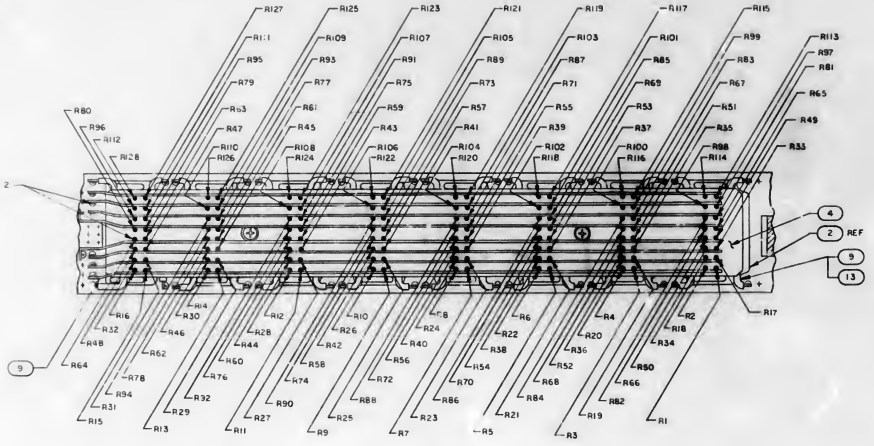
ITEM	1008097	SCHEMATIC	REF
1	1006815-4	TERMINAL	43
1	MS20364-428A	NUT, SELF LOCKING, THIN	42
A/R	1006879	SILICONE COMPOUND, THERMOCONDUCTIVE	41
4	MS16633-4015	RING, RETAINING - EXTERNAL	40
4	1004548-1	WASHER, FLAT	39
A/R	1006776-16	INSULATION SLEEVING	38
A/R	20-W-343, TYPE S, #16	WIRE, ELEC	37
4	1006708	TERMINAL STUD	36
2	1006755-133	CAPACITOR	35
1	1006755-79	CAPACITOR	34
A/R	1006776-21	INSULATION SLEEVING	33
A/R	1006757-14	WIRE, ELEC .010 X.020	32
6	1008024-3	WASHER, INSULATOR	31
1	1004215-3	INSULATOR	30
A/R	1006776-20	INSULATION SLEEVING	29
A/R	1006757-21	WIRE, ELEC .032 DIA	28
A/R	1006806-9	INSULATION TAPE	27
1	1008283	DECAL	26
3	1008071-5	WASHER	25
6	1008024-4	WASHER, INSULATOR	24
1	1008021-2	BUSHING, INSULATOR	23
2	1008021-1	BUSHING, INSULATOR	22
2	MS54822	LUG, SOLDER	21
4	1004546-1	WASHER, FLAT	20
4	1004579-1	SCREW, JACKING	19
A/R	1006776-22	INSULATION, SLEEVING	18
A/R	1006757-13	WIRE, ELEC .020 DIA	17
2	MS20364-428A	NUT	16
1	1006827	TRANSISTOR	15
1	1003089-2	TRANSISTOR, POTTED	14
1	1006800	INDUCTOR	13
1	1006798	INDUCTOR	12
2	1006300	SEMICONDUCTOR DEVICE	11
5	1006755-134	CAPACITOR	10
1	1006715-2	RESISTOR	9
2	1006750-56	RESISTOR	8
1	1006788-6	RESISTOR	7
1	1010389-91	RESISTOR	6
1	1010389-43	RESISTOR	5
1	1006750-12	RESISTOR	4
1	1004215-1	INSULATOR	3
1	1004215-2	INSULATOR	2
1	1003124-011	HEADER HOUSING ASSY	1
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

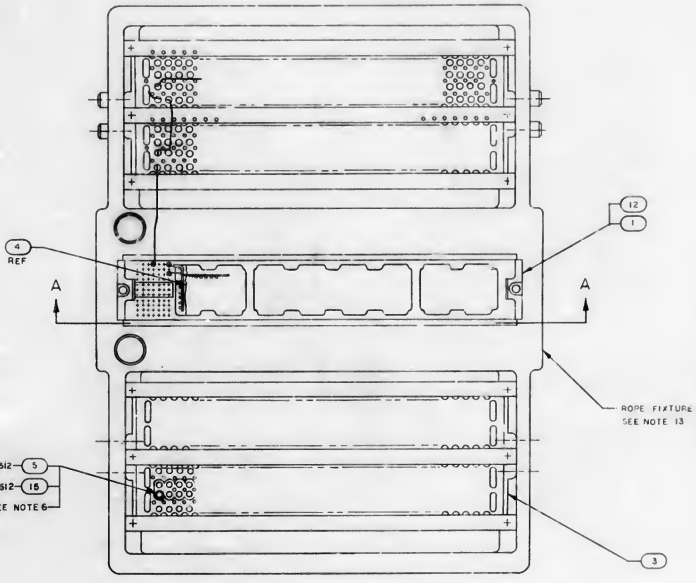
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± DECIMALS .02 ± ANGLES ° DO NOT SCALE THIS DRAWING VERTICAL	ITT INSTRUMENTATION LAB Clifton, New Jersey	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
	DRAWN [illegible] DATE 12-8-65	POWER SWITCH MODULE ASSEMBLY - 4 AGC POWER SUPPLY	
	CHECKED [illegible] DATE 12-8-65		
	APPROVAL		
	APPROVAL [illegible]		
1003700 NEXT ASSY / USED ON APPLICATION	HEAT TREATMENT / FINAL FINISH	NASA APPROVAL [illegible]	CODE IDENT NO 80230 SIZE J NASA DRAWING NO 1003389
		MIT APPROVAL [illegible]	SCALE 5/1 WT SHEET 1 OF 1

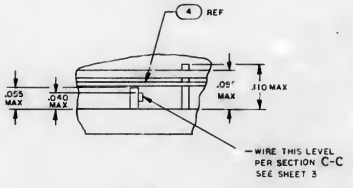
00889 B

F-3/3



PARTIAL SECTION B-B
FIND NO. 12 NOT SHOWN
SCALE: 2/1

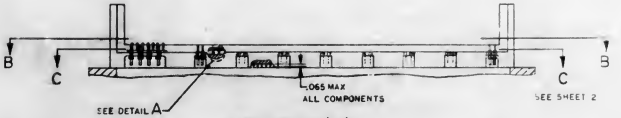




DETAIL A
SCALE: 10/1

NOTES:
1. ALL CONNECTIONS USING FIND NO.10 TO BE MADE BY SOLDERING PER NDI002071. DO NOT TIN LEADS, SOLDER WRAPS TO BE 2 TO 4 TURNS
2. ALL CONNECTIONS USING FIND NO.9 TO BE MADE BY WELDING PER NDI002005
3. NUMBER WIRE FROM TABLE SHOWN ON SHEET 3 AND PER NDI002029
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
5. BOND FIND NO.6 TO FIND NO.1 PER NDI002034 TYPE I
6. BOND FIND NO.5 AND FIND NO.15 TO FIND NO.3 USING EPOXY ADHESIVE PER NDI002215
7. WHITE DOT DENOTES LEAD TO BE CUT FOR FIRST LEVEL WIRING
8. BLACK DOT DENOTES LEAD TO BE CUT FOR SECOND LEVEL WIRING
9. K DENOTES CATHODE SIDE OF DIODE
10. AR DENOTES AS REQUIRED
11. SELECT FIND NO.8 NOTED (A) AND (B), EXAMPLE (A)-CR6 (B)-CR6, PER THE ELECTRICAL REQUIREMENTS: AT A FORWARD CURRENT OF 1.8 MA ±2%, AND AT A FORWARD CURRENT OF 3.6 MA ±2% THE VOLTAGE DROP ACROSS BOTH DIODES SHALL BE WITHIN 1 MV OF EACH OTHER
12. ASSEMBLE FIND NO. 4 TO FIND NO. USING MIL-S-22473 GRADE HV
13. THIS ASSEMBLY TO BE STUFFED WITH ROPE FIXTURE DWG NO. AP20065
14. SOLDER FIND NO.7 TO FIND NO.2 PER NDI002009, METHOD A
15. UNLESS OTHERWISE SPECIFIED ALL WIRING SHALL BE IN ACCORDANCE WITH NDI002069
16. SOLDER & COVER FIND NO.8 TO FIND NO.2 PER NDI002009 METHOD A

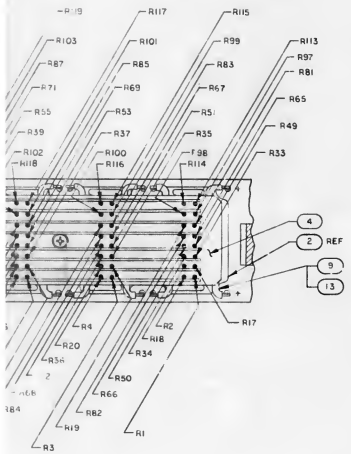
REFERENCES
1. ROPE FIXTURE DWG NO AP20065

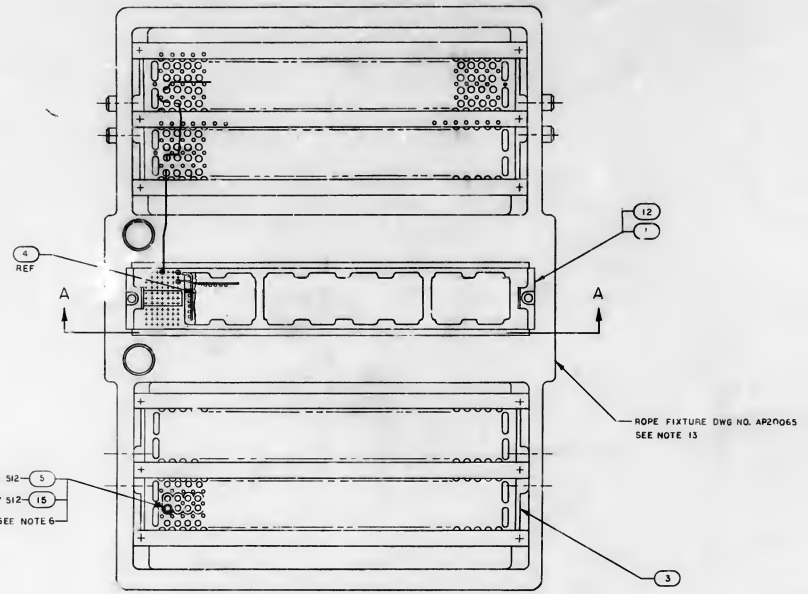


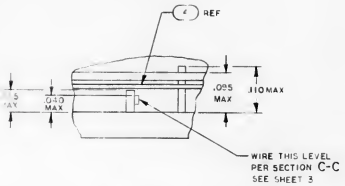
PARTIAL SECTION A-A

1003821 B F-1/2 SHEET 1

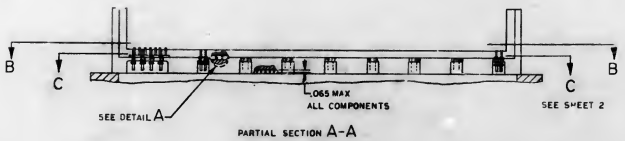
REVISIONS			
ZONE	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TORR 18039 DR [illegible] CHK [illegible]	[illegible]	[illegible]
B	REVISED PER TORR 25933 DR [illegible] CHK [illegible]	[illegible]	[illegible]







DETAIL A
SCALE 10/1



PARTIAL SECTION A-A

QTY	QTY	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		1006144	SCHEMATIC	REF
512		1006320-001	CORE, MAGNETIC	15
2	2	1000093-2	SCREW, BUTTON HD	14
AR	AR	1006776-22	SLEEVING	13
	1	1003135-011	HEADER, ASSY	12
2	2	1004237	WASHER, FLAT	11
AR	AR	1006275-1	WIRE, ELECTRICAL	10
AR	AR	1006757-1	WIRE, .010 X .020	9
256	256	1036751	DIODE	8
128	28	1006750-39	RESISTOR, FIXED 2K	7
1	1	1003134	TERMINAL BOARD ASSEMBLY	6
	512	1006298-1	CORE, MAGNETIC	5
1	1	1004235-3	INSULATOR	4
4	4	1004233	HOLDER, CORE	3
1	1	1004232	HOLDER, COMPONENT	2
1		1003135	HEADER ASSEMBL	1

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .X .XX .XXX ±
		DO NOT SCALE THIS DRAWING
1003133		MATERIAL
1003733		HEAT TREATMENT
NEXT ASSY	USED ON	FINISH
APPLICATION		

MIT INSTRUMENTATION LAB Cambridge, Mass.
DR-JAN [illegible] DATE 9/28/64
CHECKED [illegible] 9/28/64
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

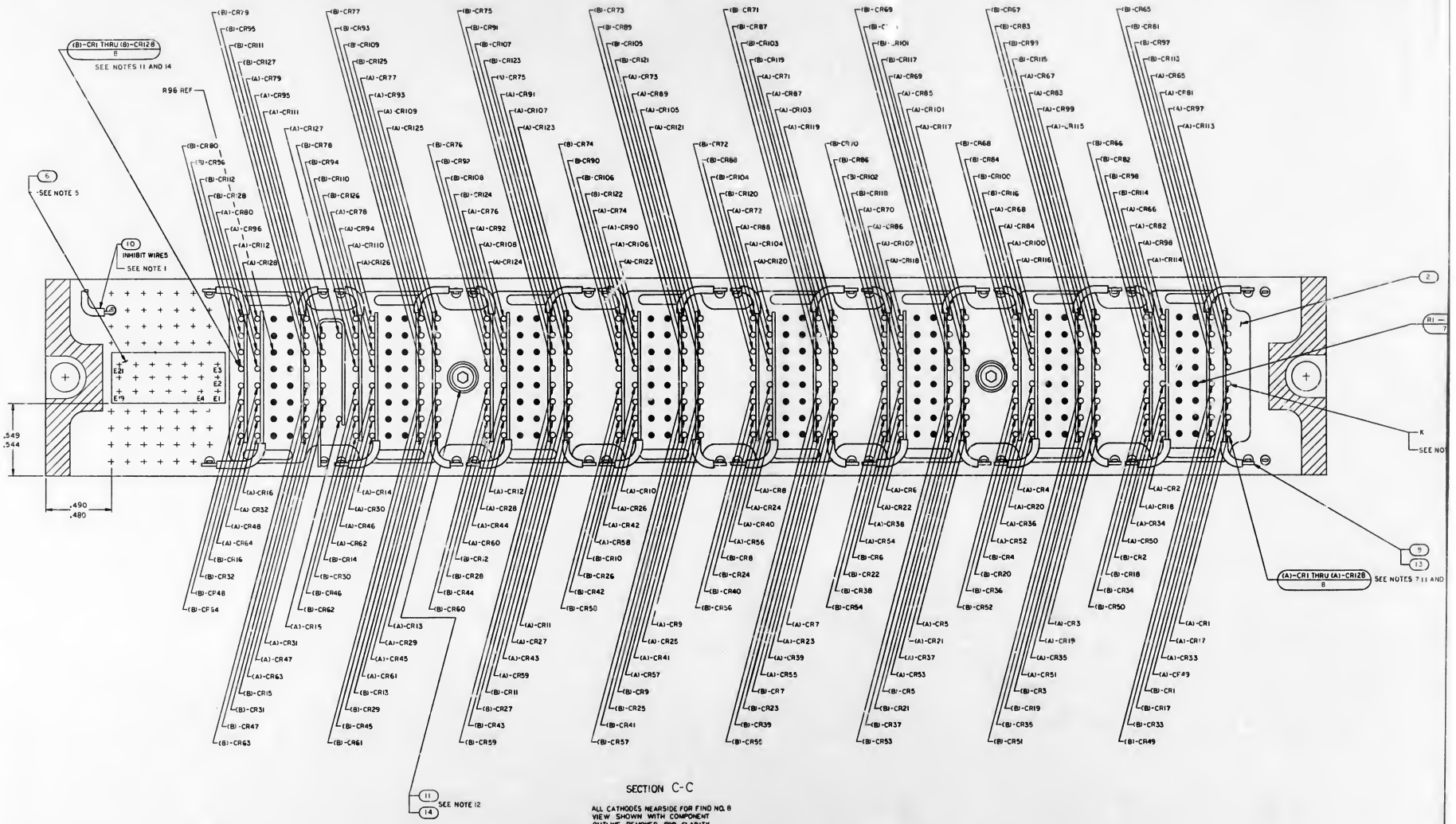
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE SUBASSEMBLY

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	J	1003821

SCALE 1/1 WT SHEET 1 OF 3

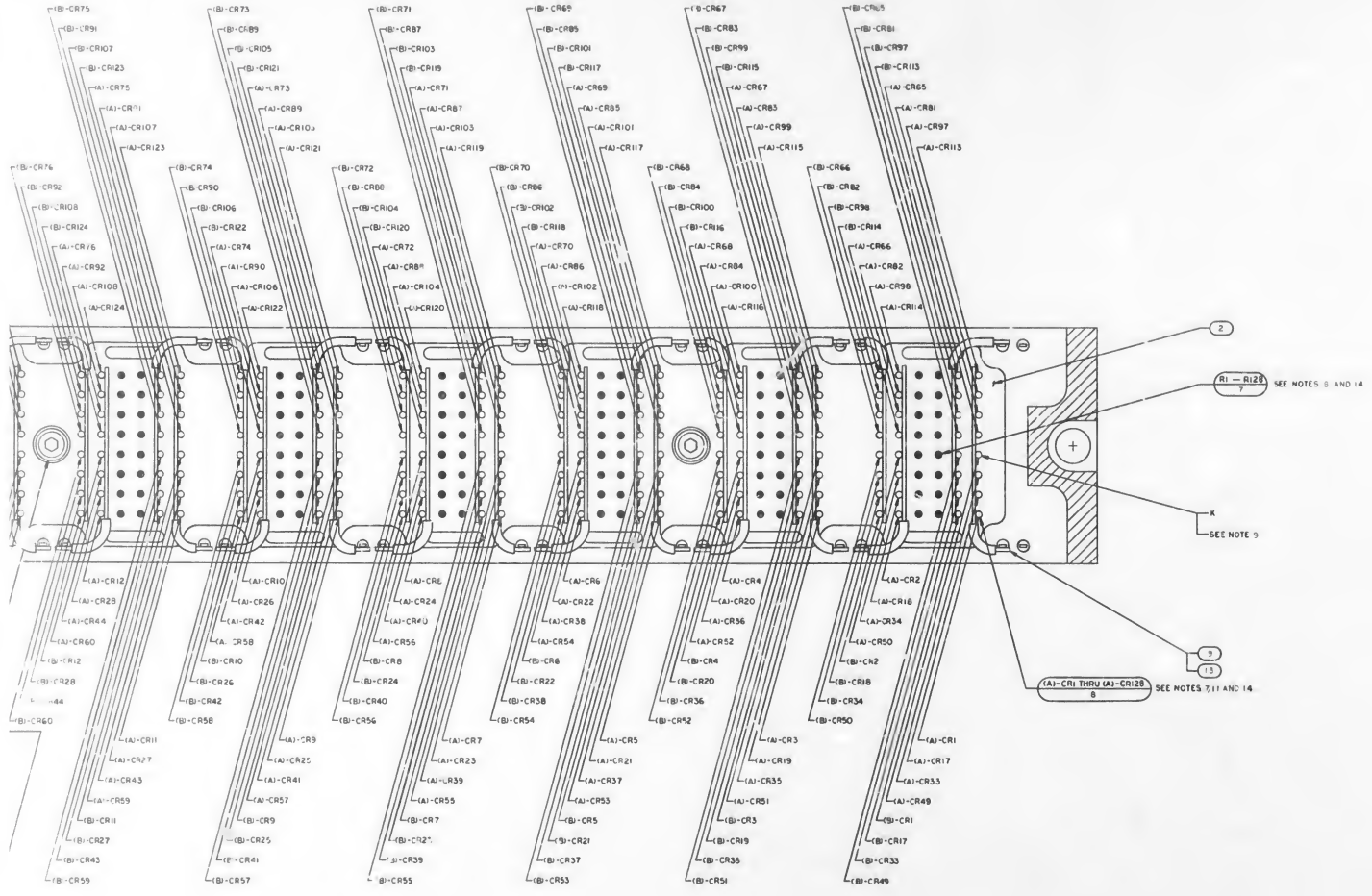
MASTER



1003821 B F-1 / 2 SHEET 2

B 1003821

SYM	DESCRIPTION	BY	APPROVED
A	REVISED PER TDRR 18039 DR CHK		
B	REVISED PER TDRR 25933 DR CHK		



SECTION C-C

ALL CATHODES NEGATIVE SIDE FOR FIND NO. 8
VIEW SHOWN WITH COMPONENT
OUTLINE REMOVED FOR CLARITY

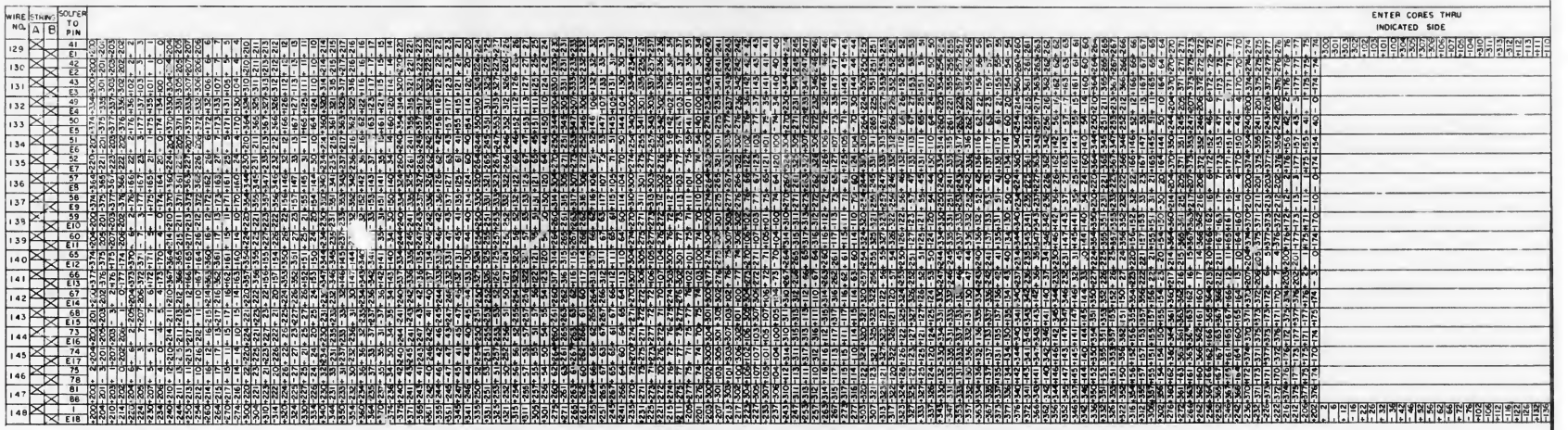
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

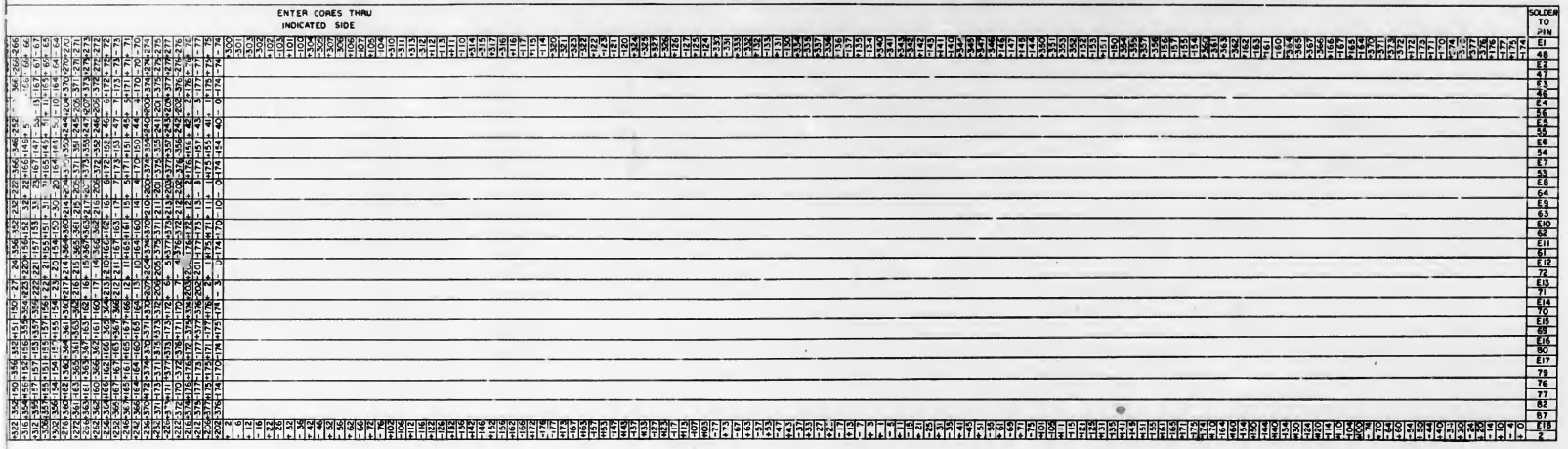
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ° DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINISH NEXT ASSY USED ON APPLICATION	ITT INSTRUMENTATION L.D. DRAWN CHECKED APPROVAL APPROVAL PROJ. APPROVAL NOT APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS ROPE MEMORY MODULE SUBASSEMBLY CODE IDENT NO 80230 REV J DWG NO 1003821 SCALE 4/1 WT SHEET 2 OF 3

1003821 SHEET 2

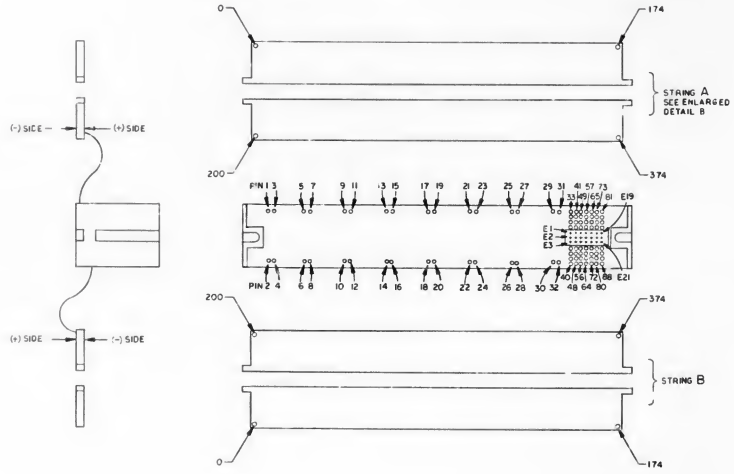
F-2/2

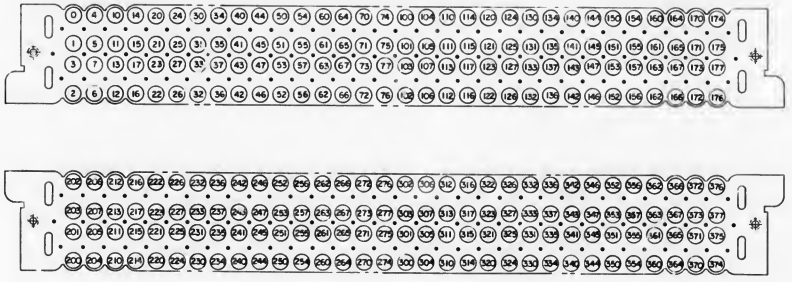
INHIBIT WIRING TABLE




ENTER CORES THRU
INDICATED SIDE
SOLDER TO PIN

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDIB 19039 DR # Bradford CHK Duff	4 Feb 69	
B	REVISED PER TDRR 25933 DR # Duff CHK Duff	25 Feb 69	





DETAIL B

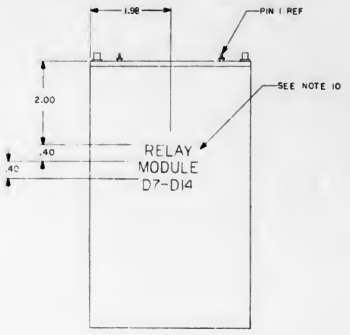
QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

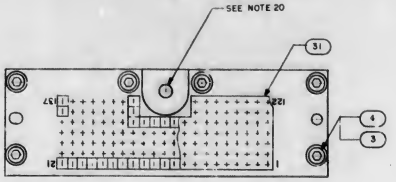
		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRAC. ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH	MIT INSTRUMENTATION LAB Cambridge, Mass. DRAWN R. J. Blum DATE 11 Mar 68 CHECKED APPROVAL APPROVAL D. C. Hamilton NASA APPROVAL P. Kalan 3/19/69 MIT APPROVAL R. Battey 3-19-69
NEXT ASSY	USED ON	APPLICATION	CODE IDENT NO 80230 SIZE J NASA DRAWING NO 1003821 SCALE NONE WT SHEET 3 OF 3

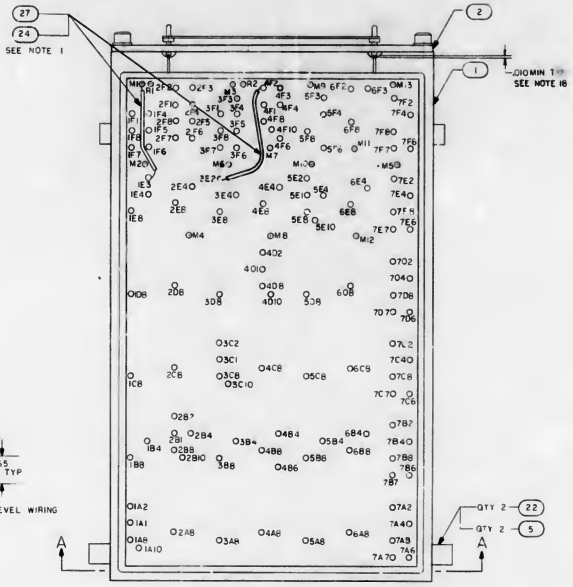
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROPE MEMORY MODULE
SUBASSEMBLY

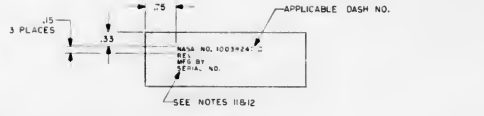
REVISIONS				20557	
LTR	ZONE	DESCRIPTION	DATE	APPROVED
A		REVISED PER TDRR 20820		
B		REVISED PER TDRR 24495		
C		REVISED PER TDRR 28403		
D		REVISED PER TDRR 30413		
E		REVISED PER TDRR 31541		



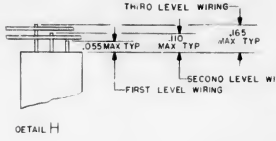




VIEW SHOWN WITH POTTING & WIRING REMOVED FOR CLARITY



MARKING VIEW
SCALE 1/1



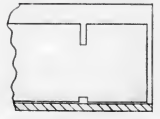
DETAIL H

WIRING LIST	
TO	FROM
1	7D4
2	7E2
3	7D7
4	6E6
5	M3
6	3F4
7	7A6
8	5E10
9	M7
10	4A8
11	402
12	401
13	4F8
14	3C10
15	3C9
16	3F7
17	2F5
18	2B8
19	2D8
20	M2
21	1A8
22	7E4
23	7C6
24	7D8
25	7B7
26	M10
27	5F6
28	7A7
29	5E8
30	M8
31	4E4
32	4C8
33	4E8
34	4F1
35	3C2
36	2B4
37	3F1
38	M4
39	2B1
40	2F6
41	1E4
42	1B8
43	7F4
44	7F7
45	M12
46	6F2
47	6D8
48	7B7
49	6B8
50	5E1
51	5C8
52	4B4
53	4F6
54	4D8
55	3B8
56	3F3
57	3F8
58	2D10
59	2A8
60	2C6
61	2E8
62	1A10
63	1C8
64	7F6
65	F2
66	7D2
67	6F8
68	7B8

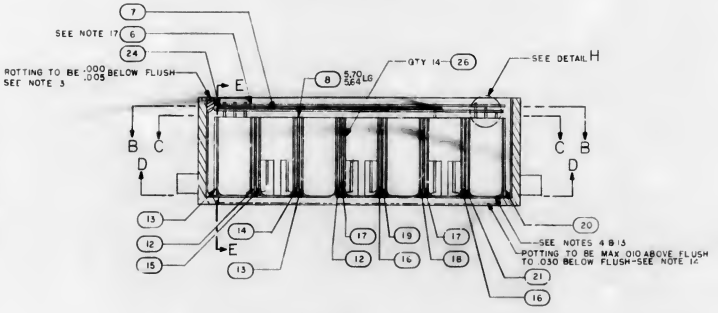
WIRING LIST	
TO	FROM
69	7A2
70	6B4
71	5E2
72	5B6
73	5B4
74	4D10
75	4F10
76	3A8
77	M6
78	3F4
79	3E8
80	2B2
81	2F4
82	2F7
83	1A2
84	1F1
85	7E6
86	7F8
87	7E7
88	7C7
89	7B6
90	6C8
91	5F8
92	5D8
93	5A8
94	4B6
95	4B8
96	4F4
97	3B4
98	3F4
99	3F5
100	3D8
101	2E4
102	2F3
103	2F1
104	1A1
105	1F7
106	M5
107	7C4
108	M11
109	7C8
110	6E4
111	7A4
112	6A8
113	M3
114	R2
115	3F6
116	3F5
117	R1
118	1F6
119	1B4
120	1F4
121	1E8
122	M13
123	7D6
124	7E8
125	7C2
126	7B4
127	7A6
128	5E4
129	6F3
130	5F3
131	4F5
132	2F8
133	2F2
134	1F5
135	SPARE
136	1F8
137	1D8

* DENOTES NO CONNECTION

NOTES:
1. WELD ALL FIRST & SECOND LEVEL CONNECTIONS AND AS NOTED ON THIRD LEVEL PER NO 1002005
2. FOR THIRD LEVEL CONNECTIONS USE FIND NO 34 & WIRE WRAP ONE END TO FIND NO.2 PER NO 1002031 AND WELD ALL OTHER ENDS PER NO 1002005
3. FILL CAVITY EXCEPT WHERE INDICATED WITH BLACK POLYURETHANE FOAM PER NO 1002102
4. SPRAY COAT ALL INSIDE SURFACES OF FIND NO.1 WITH CLEAR EPOXY PER NO 1002035 EXCEPT .010 MAX THICKNESS
5. ▲ DENOTES LEADS TO BE CUT .030 MAX ABOVE SURFACE OF FIND NO.9 & FIND NO.10
6. ● DENOTES LEADS TO BE CUT AFTER WELDING
7. ~~EXTEND HOLE INDICATED .100(4) NO BEYOND INSIDE SURFACE OF FIND NO.1~~
8. AR DENOTES AS REQUIRED
9. BOND FIND NO. 9, 10, 25 & 29 TO FIND NO.26 PER NO 1002004, TYPE X
10. MARK 24 HIGH WHITE CHARACTERS PER NO 1002019 AND NO 1002122 OR TYPE II, CLASS I USING MARKING INK 1006271-1
11. MARK 12 HIGH WHITE CHARACTERS PER NO 1002019 AND NO 1002122 TYPE II, CLASS USING MARKING INK 1006271-1
12. SERIALIZE PER NO 1002023
13. BOND STICKS TO FIND NO 1 PER NO 1002004, TYPE I
14. FILL CAVITY PER NO 1002217
15. WORKMANSHIP, FABRICATION AND INSPECTION REQUIREMENTS PER NO 1002069
16. STAKE FIND NO.35 & 28 TO FIND NO.25 & 29 PER NO 1002009, METHOD B
17. STAKE THIRD LEVEL WIRING TO FIND NO.6 PER NO 1002004, TYPE X USE STAKING COMPOUND SPARINGLY
18. ~~ALL TERMINALS TO HEADER PER NO 1002004, TYPE VI~~
19. ~~FIND NUMBER 10 MAY BE EITHER 1006772-1 OR 1006772-2 EXCEPT DO NOT USE BOTH IN THE SAME ASSY.~~
20. NOSE INDICATED TO BE FREE OF POTTING TO INSIDE SURFACE OF FIND NO.1
21. COLOR OF FIND NO. 34 TO BE OPTIONAL



PARTIAL SECTION E-E



SECTION A-A

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE VALUES ARE IN μ" REGULAR VALUES ARE IN DECIMAL FRACTIONS DECIMALS ANGLES .X ±.02 DO NOT SCALE THIS DRAWING	MATERIAL
1003707	
1003706	
NEXT ASSY	USED ON
APPLICATION	

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

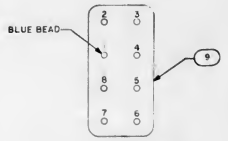
DRAWN [illegible] 1/4/67
CHECKED [illegible] 1/4/67
APPROVED [illegible] 1/4/67
APPROVED [illegible] 1/4/67
APPROVED MIT [illegible] 1/4/67
APPROVED NASA [illegible] 2/1

RELAY MODULE ASSEMBLY
AGC DSKY, NAV & MAIN

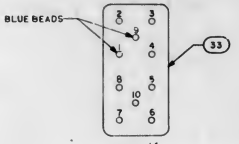
CODE IDENT NO 80230 | SIZE J | DRAWING NO 1003824 | SHEET 1 OF 2

5 | 1003824 | SHT 1 OF 2 | 4 | 3 | 2

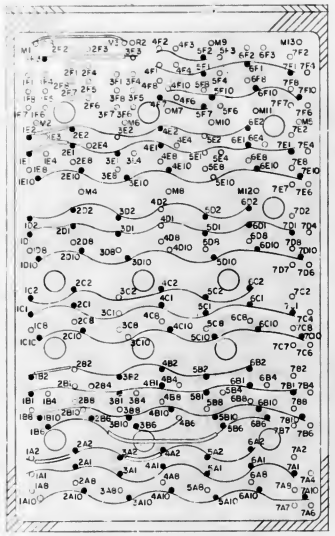
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 20820		
B	REVISED PER TDRR 26495		
C	REVISED PER TDRR 28403		
D	REVISED PER TDRR 30413		
E	REVISED PER TDRR 31541		



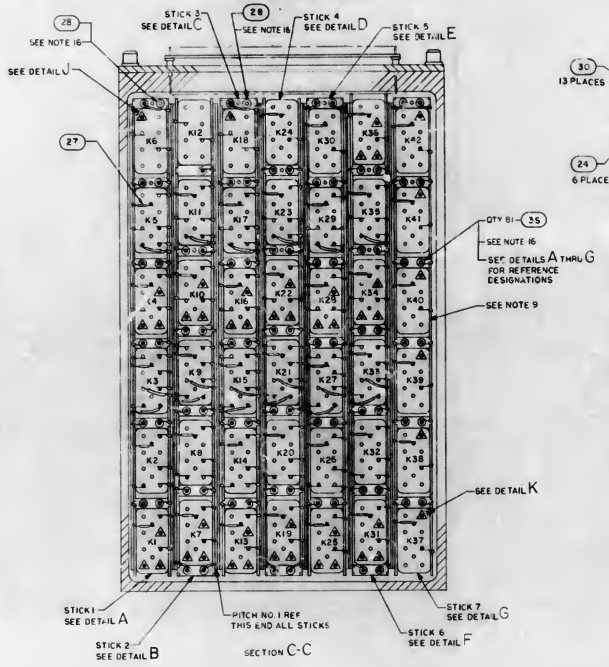
DETAIL J
SCALE 4/1
TYP PIN DESIGNATIONS OF K6, K12 AND K18



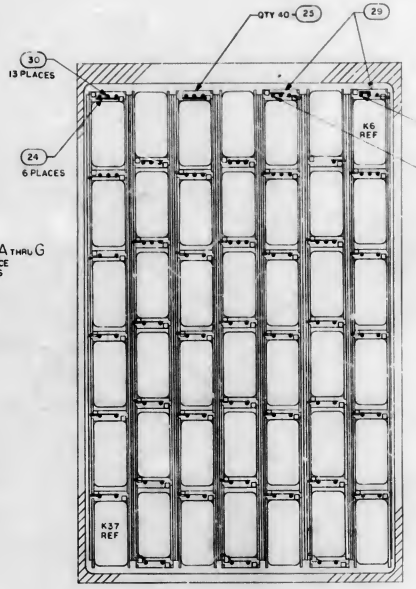
DETAIL K
SCALE 4/1
TYP PIN DESIGNATIONS OF K1 THRU K5, K7 THRU K11 K13 THRU K17, K19 THRU K42



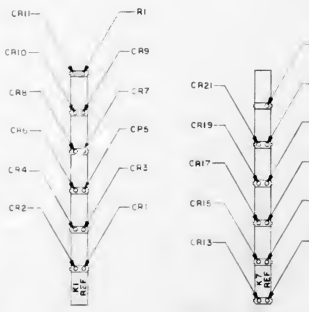
SECTION B-B



SECTION C-C

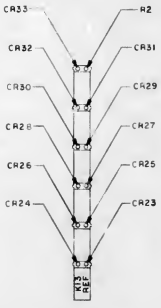


SECTION D-D
ALL FIND NO. 11 CATHODES THIS SIDE

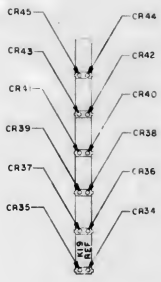


DETAIL A
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1

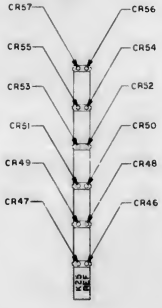
DETAIL B
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1



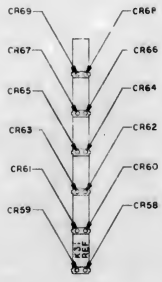
DETAIL C
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1



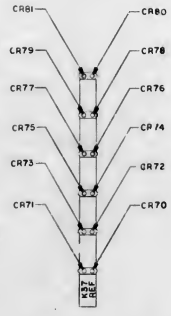
DETAIL D
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1



DETAIL E
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1



DETAIL F
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1



DETAIL G
FOR DIODE REFERENCE DESIGNATIONS ONLY
SCALE 1/1

SEE NOTE 21

			SCHEMATIC	REF
		1005780		
81		1006399	SEMICONDUCTOR DEVICE, DIODE	35
AR		1006732	WIRE ELECTRICAL	34
39		1006772-7	RELAY ARM, MAGNETIC LATCHING	33
~~AR~~	~~REF~~	~~1006376-003~~	~~WIRE, ELECTRICAL~~	32
1		1004654	GASKET	31
AR		1006757-13	WIRE ELECTRICAL .020 DIA	30
2		1004124-2	BLOCK, DIODE	29
2		1006750-72	RESISTOR, FIXED	28
AR		1006776-22	INSULATION, SLEEVING	27
14		1004952	BACKING STRIP	26
40		1004124-1	BLOCK, DIODE	25
AR		1006757-7	WIRE ELECTRICAL .005 X .020	24
~~AR~~	~~REF~~	~~1006732~~	~~WIRE ELECTRICAL~~	23
2		IC 34540	PIN, STOP	22
1		1003521-5	800 MATRIX ASSY	21
1		1003521-26	800 MATRIX ASSY	20
1		1003521-21	800 MATRIX ASSY	19
1		1003521-3	800 MATRIX ASSY	18
2		1003521-32	800 MATRIX ASSY	17
2		1003521-34	800 MATRIX ASSY	16
1		1003521-29	800 MATRIX ASSY	15
1		1003521-30	800 MATRIX ASSY	14
2		1003521-27	800 MATRIX ASSY	13
2		1003521-28	800 MATRIX ASSY	12
~~8~~		~~1006751~~	~~SEMICONDUCTOR DEVICE, DIODE~~	11
~~AR~~	~~REF~~	~~SEE NOTE 19~~	~~RELAY ARM, MAGNETIC LATCHING~~	10
3		1006815-2	RELAY ARMATURE	9
AR		1006806-10	INSULATION TAPE, ELECTRICAL	8
1		1004842-1	INSULATOR	7
1		1004842-2	INSULATOR	6
2		MS35200-13	SCREW, FLATHEAD	5
5		NAS620-4	WASHER, FLAT	4
6		MF42457-1	SCREW, SOCKET	3
1		1004145	PLATE, RELAY MODULE	2
1		1004118	HEADER ASSY, RELAY MODULE	1
QTY REQD		PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

G11 — USE OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. CAPACITOR VALUES ARE IN μf. RESISTOR VALUES ARE IN OHMS. TOLERANCES ON FRACTIONS ± DECIMALS ANGLES ± .X ± .XX ± DO NOT SCALE THIS DRAWING

MATERIAL

NEXT ASSY USED ON APPLICATION

MIT INSTRUMENTATION LAB CAMBRIDGE MASS.

MANNED SPACECRAFT CENTER HOUSTON TEXAS

DRAWN CHECKED APPROVED APPROVED

RELAY MODULE ASSEMBLY AGC DSKY, NAV AND MAIN

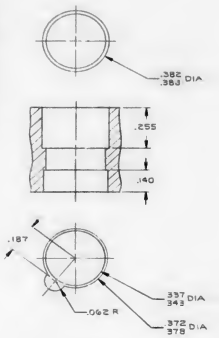
APPROVED MIT APPROVED MSC

CODE IDENT NO. 80230 SIZE J DRAWING NO. 1003824

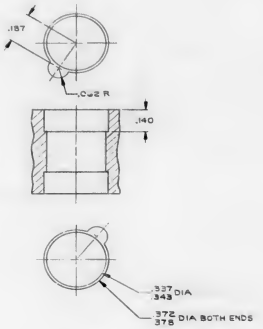
DATE 3/1 SCALE SHEET 2 OF 2

HOLE IDENT	X DIM	Y DIM	HOLE SIZE	TOL
1	0.000	0.000	C	.005
2	-.085	.256	A	
3	.160	.374	E	
4	.240	.121	A	
5	.308	-.139	A	
6	.417	-.068	A	
7	.337	.035	A	
8	.386	.155	A	
9	.416	.282	A	
10	.416	.439	A	
11	.520	.359	A	
12	.588	.247	A	
13	.591	.508	A	
14	.675	-.006	E	
15	.831	.367	C	
16	.911	.111	A	
17	1.077	.257	A	
18	1.158	0.000	C	
19	.816	.372	E	
20	1.400	.119	A	
21	1.466	-.139	A	
22	1.493	.030	A	
23	1.542	.152	A	
24	1.574	-.069	A	
25	1.574	.280	A	
26	1.574	.436	A	
27	1.677	.359	A	
28	1.717	.508	A	
29	1.747	.246	A	
30	1.834	-.006	E	
31	1.958	.367	C	
32	2.070	.113	A	
33	2.199	-.140	A	
34	2.199	-.011	A	
35	2.199	.117	A	
36	2.257	.381	A	
37	2.257	.508	A	
38	2.324	.150	A	
39	2.335	.279	A	
40	2.394	-.029	D	
41	2.453	.177	A	
42	2.465	.421	D	
43	2.591	-.140	A	
44	2.591	-.011	A	
45	2.680	.380	A	
46	2.660	.508	A	
47	2.718	-.140	A	
48	.718	-.011	A	
49	2.716	.117	A	
50	2.790	.380	A	
51	2.790	.508	A	
52	0.843	.150	A	
53	2.867	.276	A	
54	2.914	-.029	D	
55	2.973	.177	A	
56	2.998	.421	D	
57	3.109	-.140	A	
58	3.109	-.011	A	
59	3.194	.378	A	
60	3.194	.508	A	
61	3.220	-.076	A	
62	3.220	.118	A	
63	3.378	-.107	B	
64	3.378	.087	B	
65	3.405	.247	A	
66	3.405	.378	A	
67	3.405	.508	A	
68	3.562	.282	B	
69	3.562	.477	B	
70	3.668	0.000	F	
71	3.851	.365	F	
72	3.918	.104	A	
73	4.038	-.140	A	
74	4.038	-.046	A	
75	4.096	.263	A	
76	4.096	.478	A	
77	4.123	-.047	A	
78	4.123	.138	A	
79	4.221	.220	A	
80	4.221	.300	A	
81	4.221	.508	A	
82	4.367	0.000	F	
83	4.572	.367	F	
84	4.634	.104	A	
85	4.795	-.107	B	
86	4.795	.089	B	
87	4.862	.282	B	
88	4.862	.476	B	
89	4.949	-.054	A	
90	4.949	.118	A	
91	5.020	.380	A	
92	5.020	.508	A	
93	5.047	-.140	A	
94	5.047	.030	A	
95	5.206	.107	B	
96	5.206	.069	B	
97	5.224	.282	A	
98	5.224	.382	A	
99	5.224	.508	A	
100	5.387	.282	B	
101	5.387	.476	B	
102	5.495	0.000	F	
103	5.678	.367	F	
104	5.744	.106	A	
105	5.859	-.140	A	
106	5.859	.047	A	
107	5.922	.263	A	
108	5.922	.477	A	
109	5.948	-.047	A	
110	5.948	.138	A	
111	6.046	.220	A	
112	6.046	.361	A	
113	6.046	.506	A	
114	6.212	0.000	F	
115	6.398	.367	F	
116	6.459	.106	A	
117	6.621	-.107	B	
118	6.621	.087	B	
119	6.700	.282	B	
120	6.700	.477	B	
121	6.774	-.055	A	
122	6.774	.133	A	
123	6.859	.378	A	
124	6.859	.508	A	.005

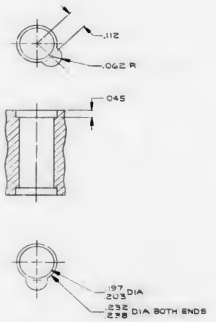
HOLE IDENT	X DIM	Y DIM	HOLE SIZE	TOL
125	1.462	.195	G	.005
126	2.717	.280	G	
127	3.257	.312	G	
128	3.320	.192	G	
129	4.725	.202	G	
130	4.995	.202	G	
131	5.035	.190	G	
132	5.115	.190	G	
133	6.58..	.217	G	
134	6.725	.017	G	
135	6.870	.017	G	.005



DETAIL C



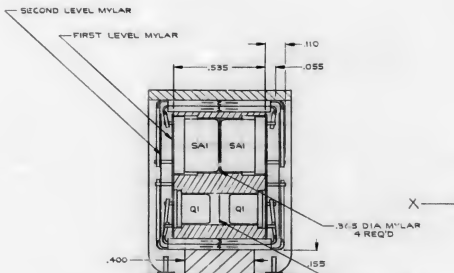
DETAIL B



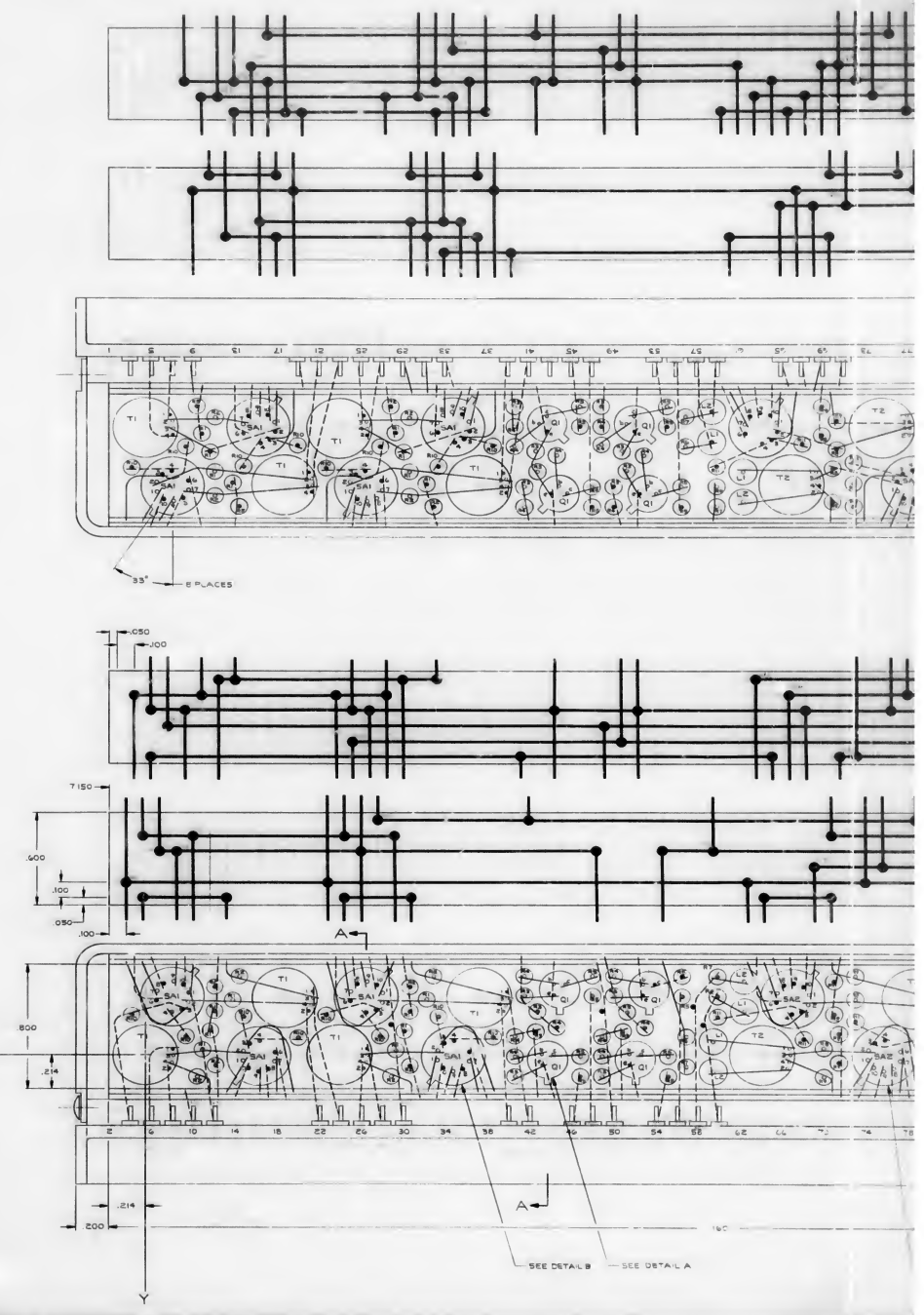
DETAIL A

NOTES
1. MATERIAL FOR COMPONENT BLOCK: PLASTIC, CLEAR ACRYLIC PER MIL-P-8184 FINISH B.
2. SCHEMATIC REF: SENSE AMPLIFIER STICK-1006083
3. R10 & R11 VALUE TO BE DETERMINED AT ELECTRICAL TEST.

HOLE SIZE	HOLE DESCRIPTION
A	.100 .104 DIA
B	.168 .172 DIA
C	.382 .388 DIA
D	SEE DETAIL A
E	SEE DETAIL B
F	SEE DETAIL C
G	.028 .032 DIA X .250 DEEP

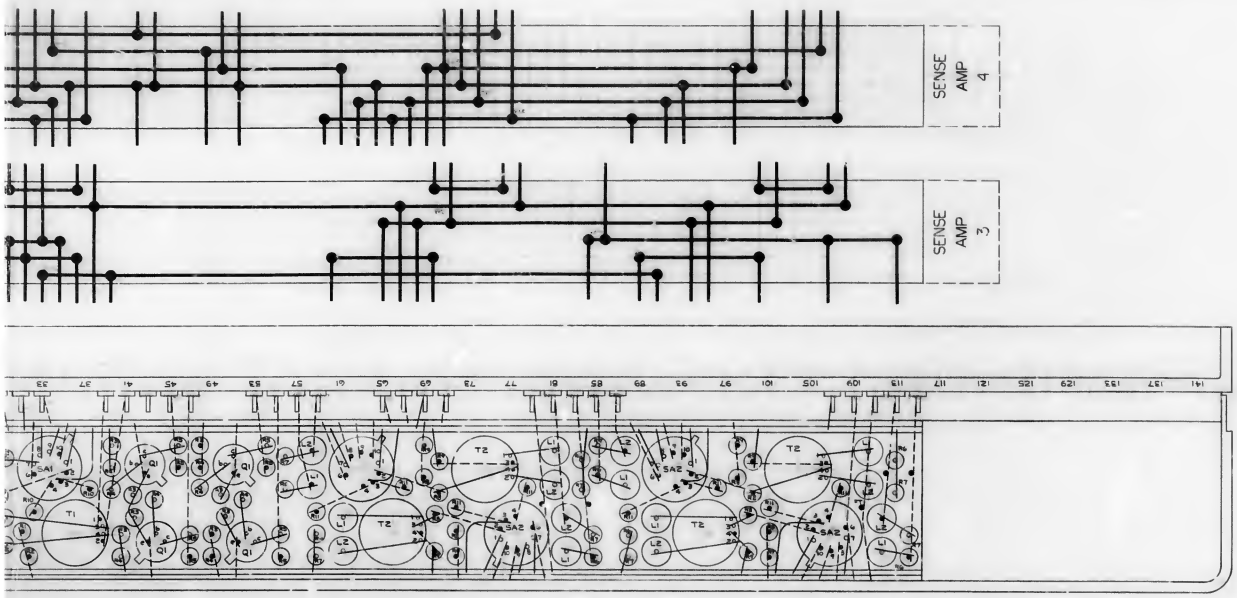


SECTION A-A



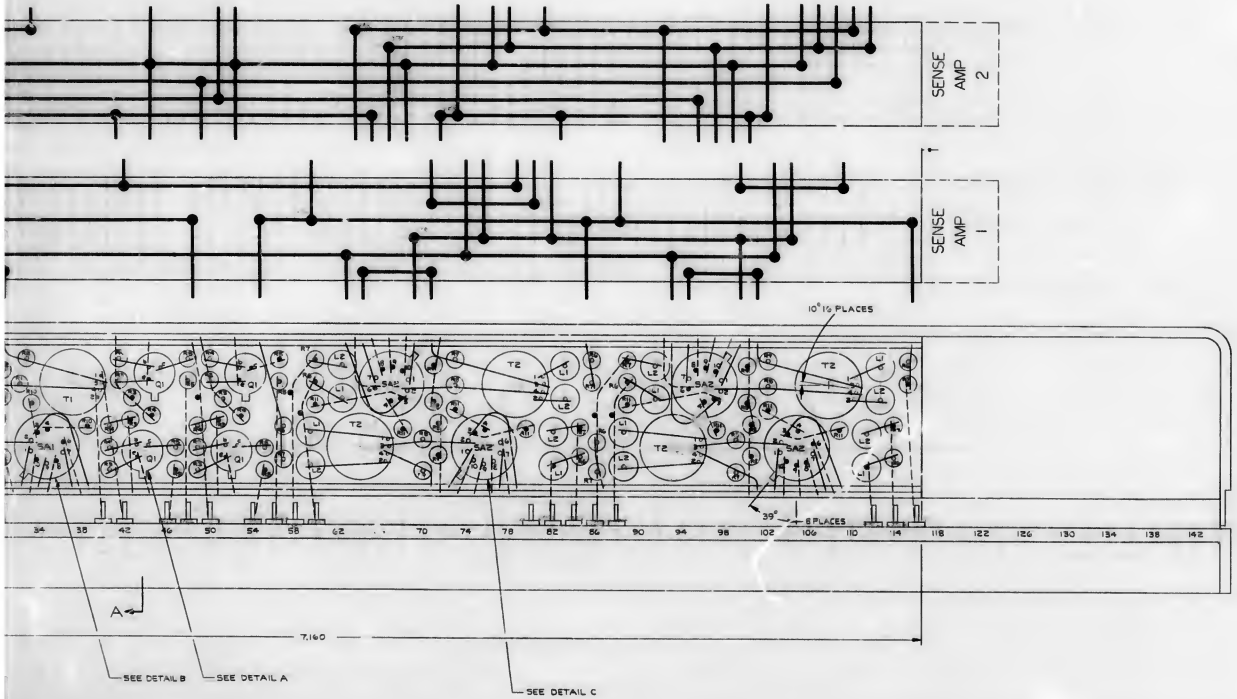
1003E001

REVISIONS			
BY#	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00933 **DATE** 4/10/73



QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS .005 ANGLES ±0°30' DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINISH	MIT INSTRUMENTATION LAB Cambridge Mass CONTRACT DRAWN Ed Bigelow DATE 7-24-68 CHECKED APPROVAL APPROVAL NASA APPROVAL MIT APPROVAL
NEXT ASSY	USED ON		
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

DESIGN LAYOUT
SENSE AMPLIFIER STICK

CODE IDENT NO	SIZE	NASA DRAWING NO
	J	1003900

SCALE 4/1 WT SHEET 1 OF 1

INCHES

A 1003901 Ⓐ

SYM	DESCRIPTION	DATE	APPROVAL
	REVISIONS TDRR 02282		
A	REPLACED BY REV B PER TDRR 04763	11-19-63	EGM EPK

TYPE	WIDTH (PITCH)	LENGTH (PITCH)	USED ON	HEADER HOUSING REF.
A	3/4	9 3/4	LOGIC	1004201
B	3/4	6 3/4	ROPE SENSE AMP.	1003109
			ERASABLE SENSE AMP.	1003109
			XK INTERFACE	1004197
			YT INTERFACE	1004194
C	1	9 3/4	ERASABLE DRIVER	
			ROPE DRIVER	
			CORRECT SWITCHING	1004192
			ROPE STRAND SELECT	1004192
			DRIVER SERVICE	1004192
			ROPE GATE	
D	1	9 3/4	CONTROL	1004198
E	1 1/2	9 3/4	ROPES	
F	1 1/2	6 3/4	POWER SWITCH	1004191
G	1 1/2	6 3/4	OSCILLATOR	
H	1 3/4	9 3/4	ERASABLE MEMORY	1003101

INACTIVE

Ⓐ REPLACED BY REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

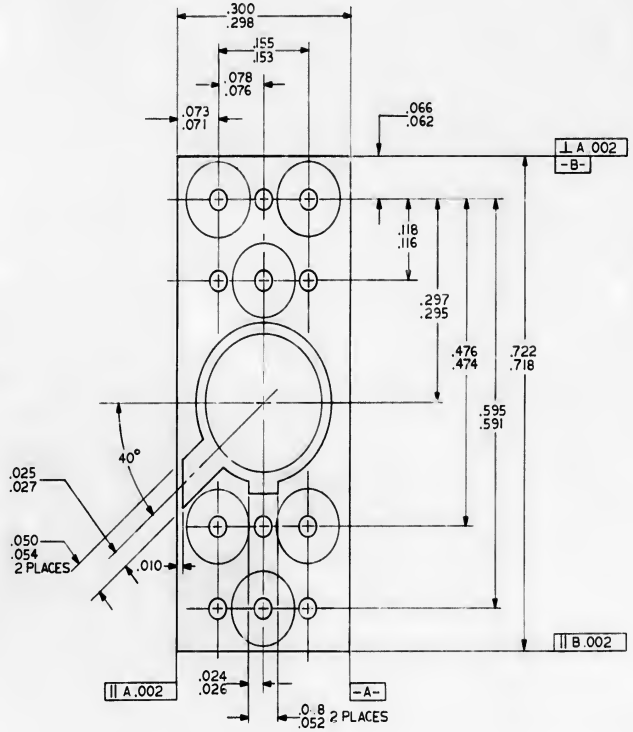
DRAWN E.J. Bukaty DATE 7-29-63
CHECKED [illegible] 7/30/63
APPROVAL W.B. Brunner 7/30/63
APPROVAL D. Morgan 7/30/63
NASA APPROVAL W.J. Adams 7-31-63
MIT APPROVAL [illegible] 7/31/63

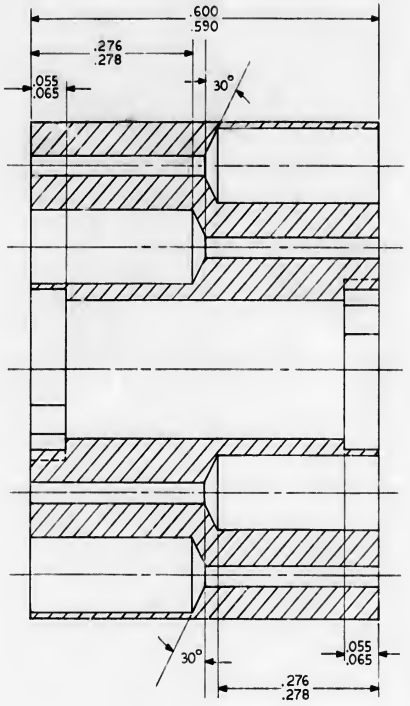
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COMPUTER MODULE
FORM FACTOR CONTROL

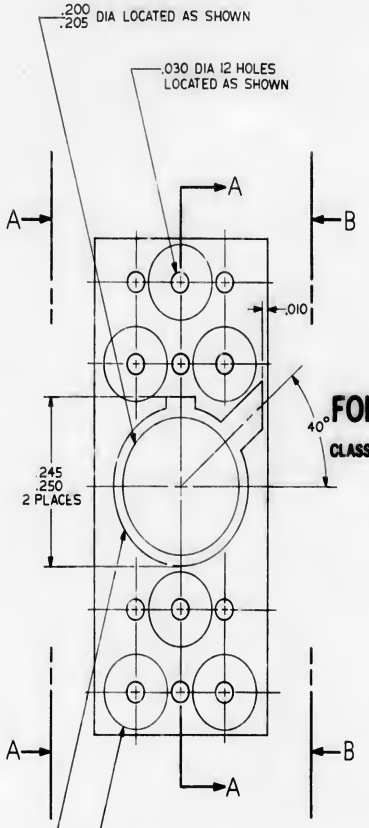
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1003909
SCALE —	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
	TAKEN FROM MIT-D-88793-C		





SECTION A-A

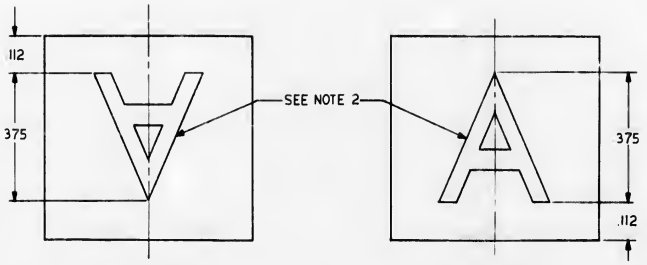


FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00004 DATE 8-9-62

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. RECESS LETTER "A" AS SHOWN .001 .002
3. CENTER LINES OF HOLES TO BE PARALLEL TO EACH OTHER AND PARALLEL TO SURFACE -A- WITHIN .005 IN 10.000
4. MATERIAL NYLON MIL-P-20693 TYPE IV



VIEW A-A
SCALE 5/1

VIEW B-B
SCALE 5/1

COLOR	PART NO
CLEAR	-4
WHITE	-5
RED	-2
YELLOW	-1
BLUE	-3

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ±.005 ANGLES ±1/2°
		DO NOT SCALE THIS DRAWING
		MATERIAL SEE NOTE 4
1003001		HEAT TREATMENT
1003004		FINAL FINISH
NEXT ASSY	USED ON	
APPLICATION		

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG. NO. CONTRACT

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN BONARRIGO DATE 8-1-62
CHECKED [signature] DATE 8/1/62
APPROVAL [signature] DATE 8/1/62
APPROVAL [signature] DATE 8/1/62
NASA APPROVAL [signature] DATE 8/9/62
MIT APPROVAL [signature] DATE 8/9/62

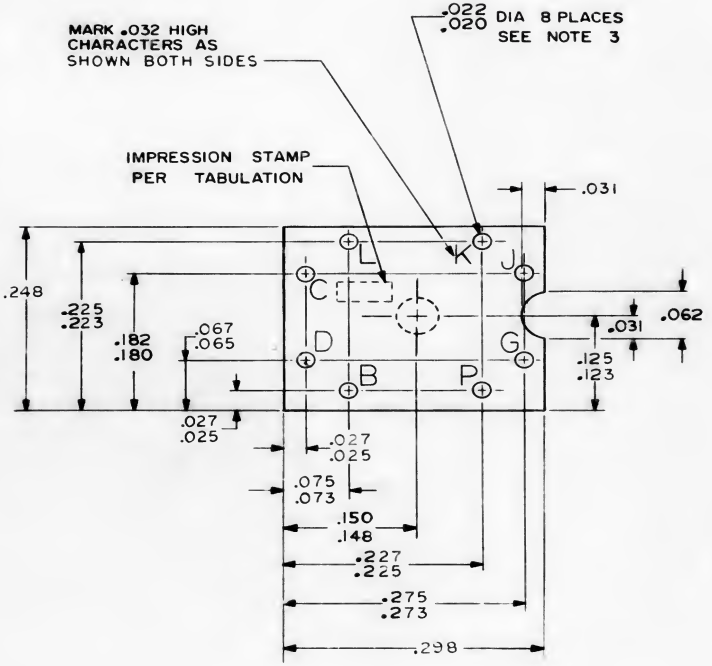
MODULE
INJECTION MOULDING

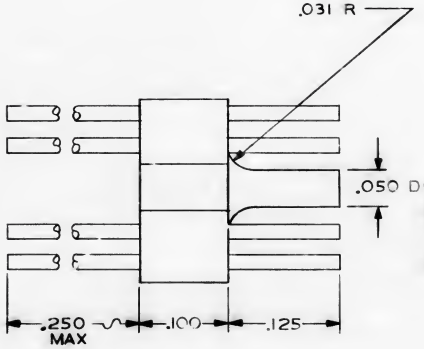
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	D	1004017
SCALE 10/1	WT	SHEET OF

1004017

1004019

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00031 **DATE** 9-27-62

PART NO.	TYPE DESIGNATOR	HOUSING COLOR
1004019-1	KA	YELLOW
1004019-2	KB	RED
1004019-3	KC	BLUE

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: GLASS FILLED DIALLYLPHTHALATE #52-01 PER MIL-M-14 F-TYPE SDG
3. PIN MATERIAL: GRADE "A" NICKEL PER QQ-N-281 PLATE PER ND 1002001

INCHES
0 1
PHOTOGRAPHIC SCALE ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003034	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2 & 3
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DEMPSKI DATE 8-3-62
CHECKED Joe Morton
APPROVAL W.E. Vinzant 9/27/62
APPROVAL Eldon C. Hall
NASA APPROVAL W.J. Kolarik 9-27-62
MIT APPROVAL L. Hafel 9/27/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

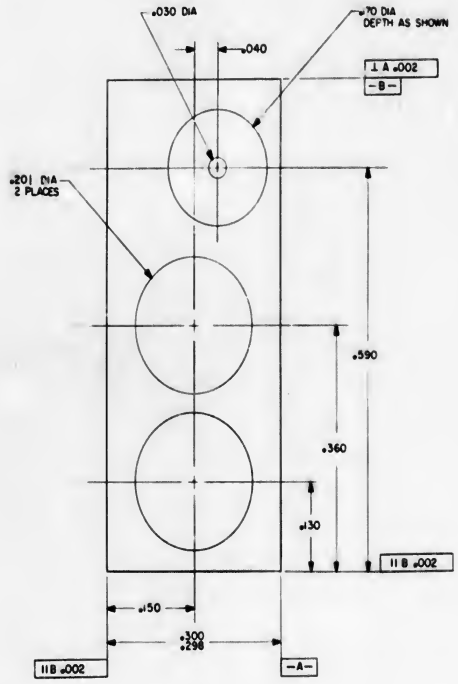
MOLDING
K CORE
(TAB)

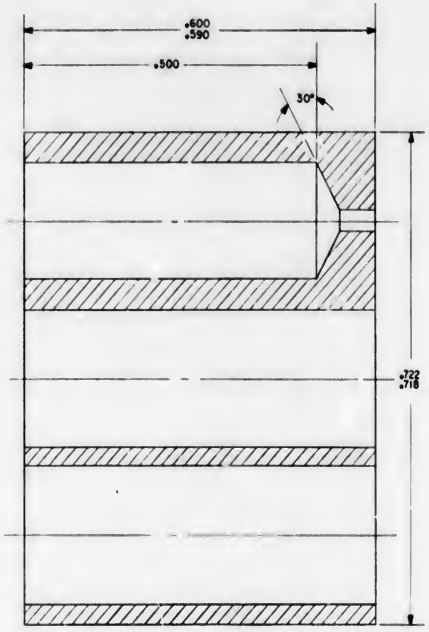
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004019

SCALE 10:1 WT SHEET 1 OF 1

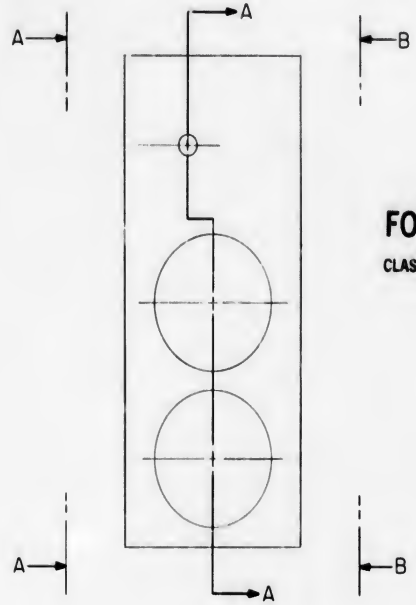
1004019

REVISIONS			
BY#	DESCRIPTION	DATE	APPROVAL





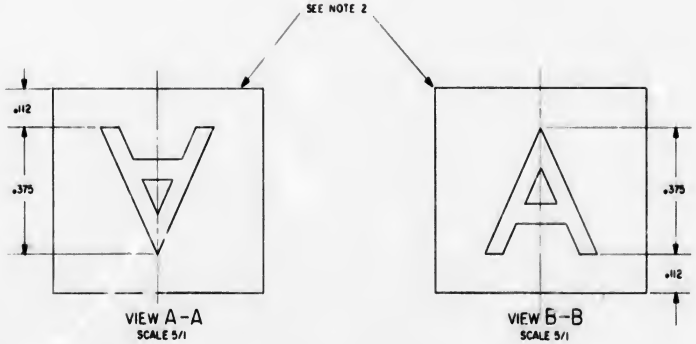
SECTION A-A



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00004 DATE 8-9-67

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. RECESS LETTER 'A' AS SHOWN .001 .002
3. CENTER LINES OF HOLES TO BE PARALLEL TO EACH OTHER AND PARALLEL TO SURFACE -A- WITHIN .005 IN 10.000
4. MATERIAL NYLON MIL-P-20693 TYPE III



VIEW A-A
SCALE 5/1

VIEW B-B
SCALE 5/1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ±.005 ANGLES ±1/2° DO NOT SCALE THIS DRAWING MATERIAL SEE NOTE 4 HEAT TREATMENT FINAL FINISH	MIT INSTRUMENTATION LAB Cambridge, Mass. DWG. NO. CONTRACT DRAWN S. Hart DATE 8-8-67 CHECKED APPROVAL APPROVAL NASA APPROVAL MIT APPROVAL
1003005			
NEXT ASSY	USED ON		
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

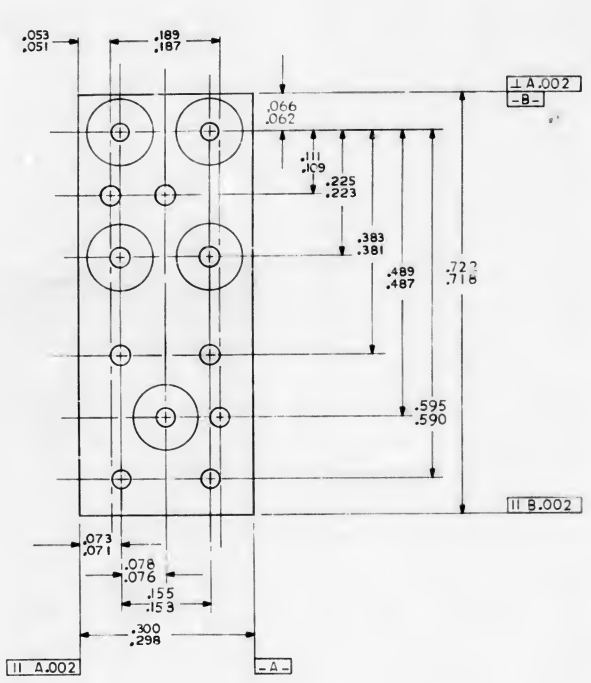
MODULE INJECTION MOULDING

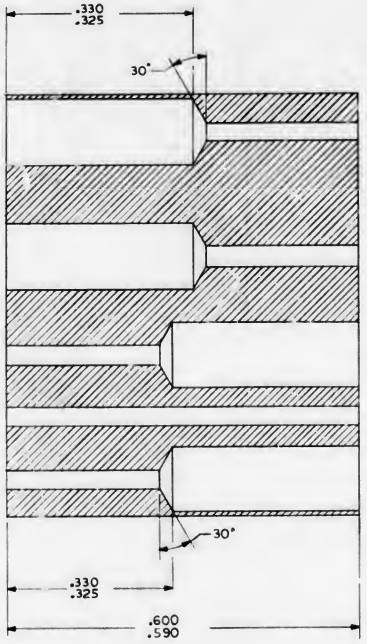
FILTER CIRCUIT

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1004021

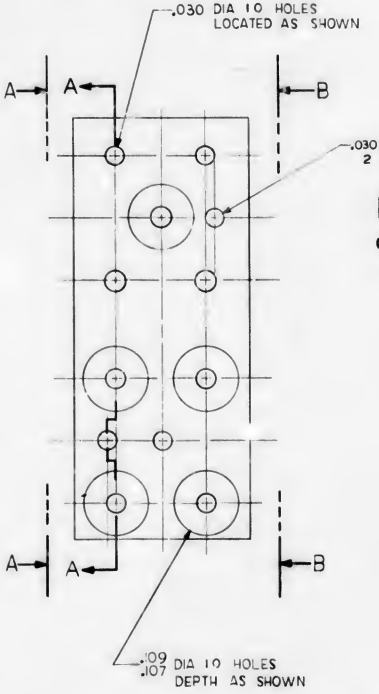
SCALE 10/1 | WT | SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



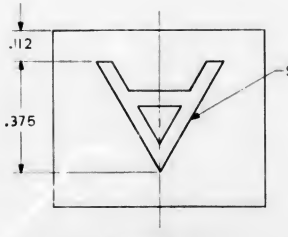


SECTION A-A

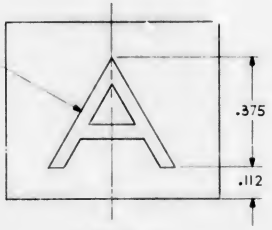


FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00004 DATE 8-9-62



VIEW A-A
SCALE 5/1



VIEW B-B
SCALE 5/1

DASH NO.	COLOR	CIRCUIT
-1	YELLOW	DA
-2	RED	DK
-3	BLUE	CA

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. RECESS LETTER "A" AS SHOWN .002 .001
3. CENTER LINES OF HOLES TO BE PARALLEL TO EACH OTHER AND PARALLEL TO SURFACE "A" WITHIN .005 IN 10.000
4. MATERIAL: NYLON MIL-P-20693 TYPE IV

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003029	
1003003	
1003002	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ANGLES ±1/2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 4
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS
DWG NO. — CONTRACT —
DRAWN DEMPSKI DATE 8-6-62
CHECKED [signature]
APPROVAL [signature] 8/7/62
APPROVAL [signature] 8-7-62
NASA APPROVAL [signature]
MIT APPROVAL [signature]

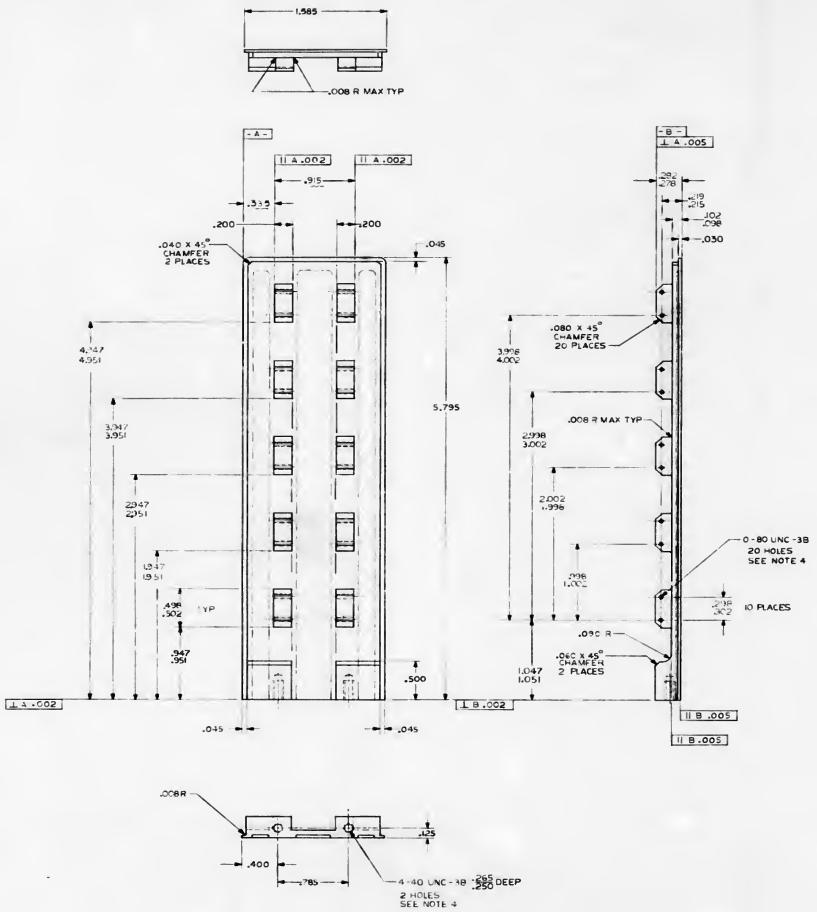
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

MODULE INJECTION MOULDING
(TAB)

CODE IDENT NO. — SIZE D — NASA DRAWING NO 1004022
SCALE 10/1 WT — SHEET — OF —

1004022

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDR 00689	3-5-62	



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00687 DATE 7-13-62

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. REMOVE ALL BURRS AND SHARP EDGES
3. ANODIZE PER MIL-A-8625 TYPE II DYED BLACK
4. OPERATION TO BE DONE AFTER ANODIZING. ALODINE 1200 CLEAR FOR ELECTRICAL PURPOSE

QTY PER UNIT	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±.005 DECIMALS ±.005 ANGLES ±0° 2' DO NOT SCALE THIS DRAWING MATERIAL 6061-T6 ALUMINUM QQ-A-327 HEAT TREATMENT	MIT INSTRUMENTATION LAB DRAWN W. HORGAN DATE 6-4-62 CHECKED APPROVAL APPROVAL NASA APPROVAL MIT APPROVAL
1003036	NEXT ASSY	USED ON	FINISH SEE NOTE 3
	APPLICATION		

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

END PLATE
COMPUTER BLOCK

CODE IDENT NO | SIZE E | NASA DRAWING NO 1004032

SCALE 2:1 WT SHEET OF

1004032 A

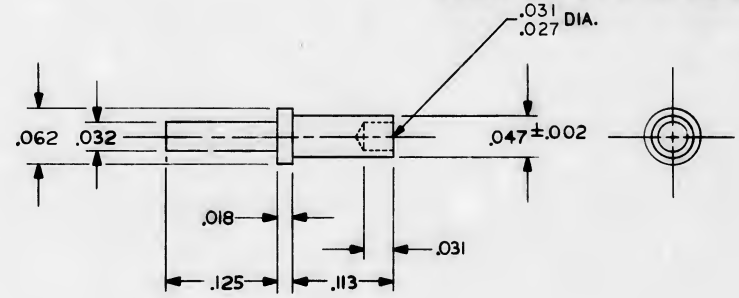
PHOTOGRAPHIC SCALE ONLY

1004067

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00063 DATE 10-11-62



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MAT'L: MONEL PER QQ-N-281A NICKEL COPPER ALLOY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

INCHES 0 1 2
PHOTOGRAPHIC SCALE ONLY

1003042	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ±.005 ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. 102355 CONTRACT

DRAWN L. SHULMAN DATE 8-10-62
CHECKED Lee Morton
APPROVAL
APPROVAL
NASA APPROVAL 10-11-62
MIT APPROVAL 10/11/62

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL

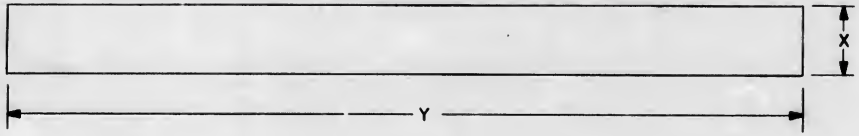
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004067

SCALE 10/1 WT — SHEET | OF |

1004081

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00514 **DATE** 6/Mar 63

DASH NO	X DIM	Y DIM
— 1	.781	8.937
— 2	1.656	9.00
— 3	.400	6.550
— 4	1.484	8.984
— 5	.796	9.00
— 6	1.40	9.00

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL D 70327
2. MATL: .003/.005 PLASTIC SHEET PER L-P-00519 TYPE 2, CLASS 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003058	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
SEE NOTE 2
HEAT TREATMENT
FINAL FINISH

MIT
INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE Mar 7 63
CHECKED 3/6/63
APPROVAL 3/5/63
APPROVAL 3/6/63
NASA APPROVAL
MIT APPROVAL 6 Mar 63

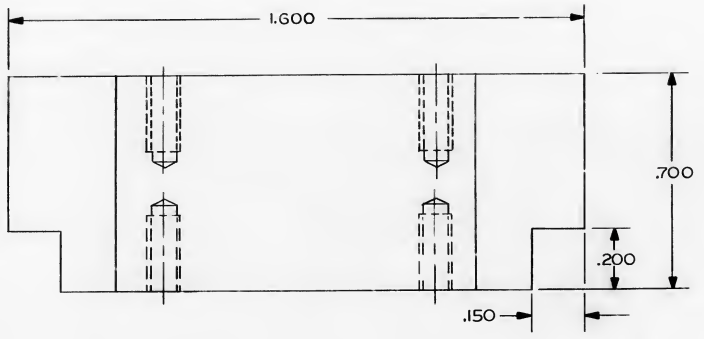
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

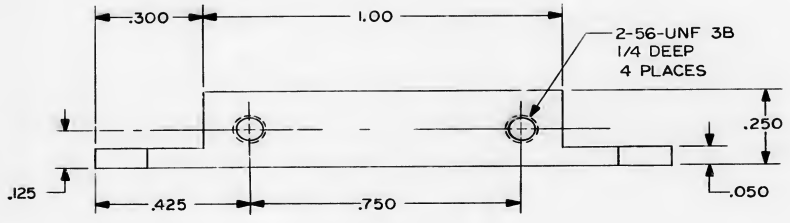
INSULATOR, MYLAR
COMPUTER

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004081
SCALE	WT	SHEET 1 OF 1

A 1004086

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00678	3-27-63	WK





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00309 DATE 30 Jan 63

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: MAGNESIUM A231B PER MIL-QQ-M-44
3. JETBLACK GALVANIC ANODIZE PER MIL-3171-A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003068	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 2
HEAT TREATMENT
FINAL FINISH: SEE NOTE 3

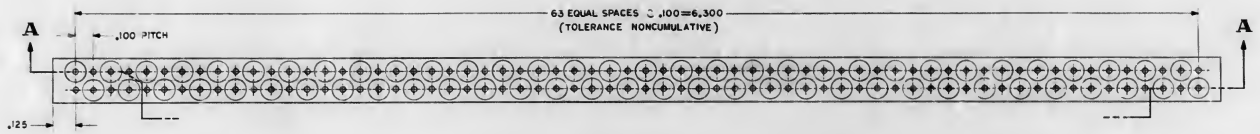
MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

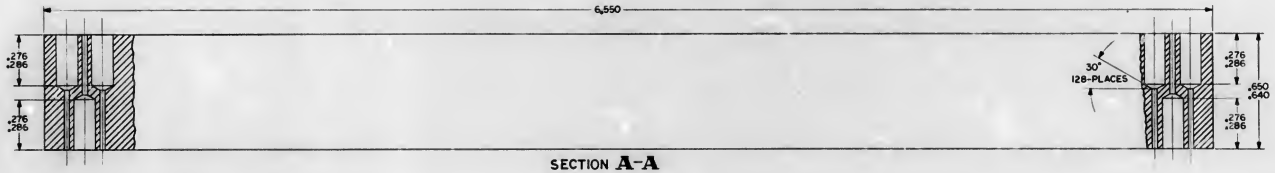
DRAWN J. Crosby DATE 12-7-62
CHECKED [illegible] 1/28/63
APPROVAL [illegible] 28 JAN 63
APPROVAL [illegible] 29 JAN 63
NASA APPROVAL [illegible] 1-30-63
MIT APPROVAL [illegible] 30 Jan 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

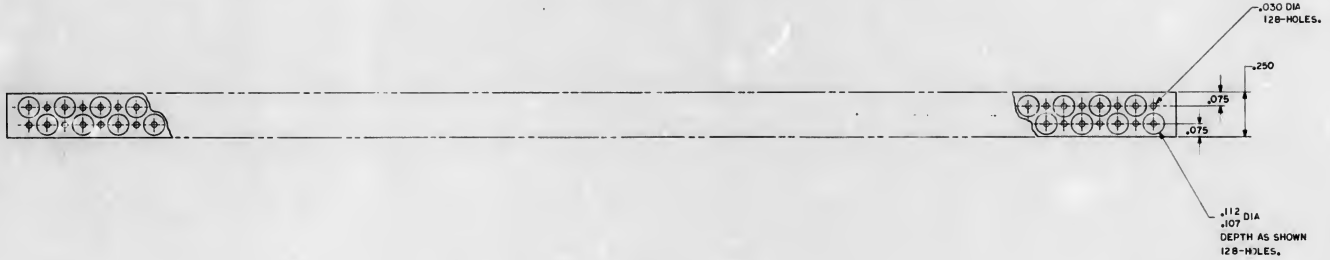
END PLATE ERASABLE MEMORY

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1004086
SCALE 4:1 | WT | SHEET OF





SECTION A-A



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00309 DATE 30 Jan 1963

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: PLASTIC, CLEAR ACRYLIC PER MIL-P-8184.

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

MIT INSTRUMENTATION LAB

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN [illegible] DATE 12-10-62
CHECKED [illegible] 1/9/63
APPROVAL [illegible] 28 Jan 63
APPROVAL [illegible]

DIODE BLOCK
ERASABLE MEMORY

NASA APPROVAL [illegible] 1-30-63

CODE IDENT NO | SIZE E | NASA DRAWING NO 1004088

MIT APPROVAL [illegible] 30 Jan 63

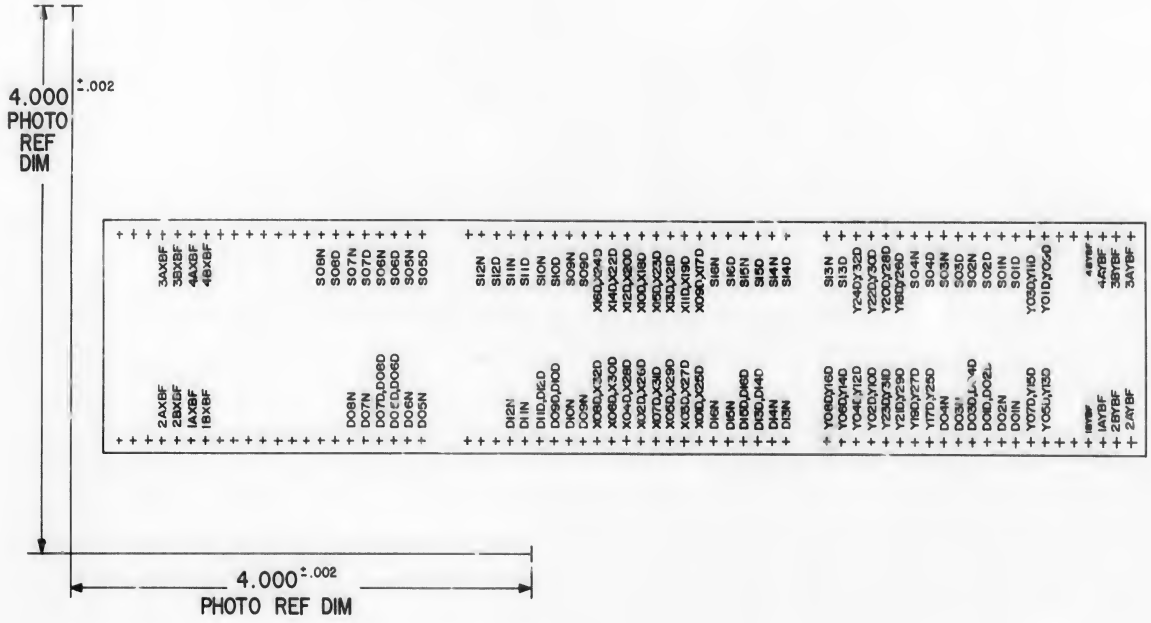
SCALE 4/1 | WT | SHEET 1 OF 1

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± 1/2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2.
HEAT TREATMENT
FINAL FINISH CLASS "B" FINISH

NEXT ASSY | USED ON
APPLICATION

1004088

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00309 DATE 30 Jan 1963

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATION SHALL NOT EXCEED .001 INCH PER INCH
3. MAKE MASTER PATTERN POSITIVE FILMS TO DIMENSIONS SHOWN
4. MATERIAL: .007 (COULD VARY) THICK PLASTIC SHEETS, SENSITIZED, DIMENSIONALLY STABLE PER L-P-00518 (NAVY-AER) TYPE II, CLASS "C"

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB, CAMBRIDGE MASS
DWG. NO. — CONTRACT —
DRAWN [illegible] DATE 12/6/62
CHECKED [illegible] 12/6/62
APPROVAL [illegible] 12/6/62
APPROVAL [illegible] 12-6-62
NASA APPROVAL [illegible] 1-30-63
MIT APPROVAL [illegible] 1-30-63

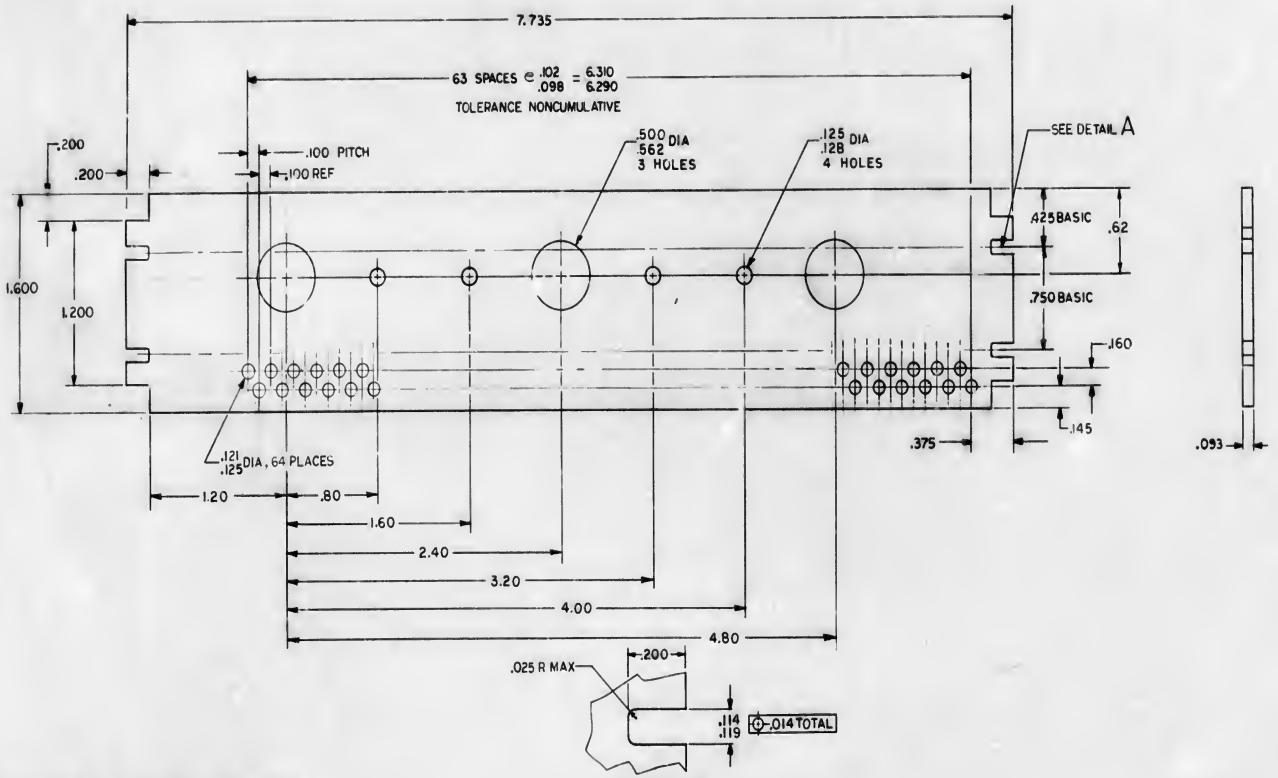
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILK SCREEN MASTER
ERASABLE MEMORY STICK

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1004089
SCALE 2/1
WT —
SHEET OF

1004089

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 00679	3-28-62	WH
B	REVISED PER TDRR 01119	5-1-63	WH
C	REVISED AND UPGRADED FROM CLASS B TO CLASS A PER TDRR 01821	29 JUNE 7/30/63	
D	REVISED PER TDRR 03745	1-22-63	
E	REVISED PER TDRR 11310 DR DC Clarmont CHK QM RMM	9/1/64	



DETAIL A
SCALE 5/1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY N.A.S.A. D-70327
2. PLASTIC SHEET, LAMINATED PER MIL-P-18177 TYPE GEE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS .005 ± .03 ANGLES ± DO NOT SCALE THIS DRAWING
		MATERIAL SEE NOTE 2
1003071		HEAT TREATMENT:
NEXT ASSY	USED ON	FINAL FINISH
APPLICATION		

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS. — DWG. NO. — CONTRACT

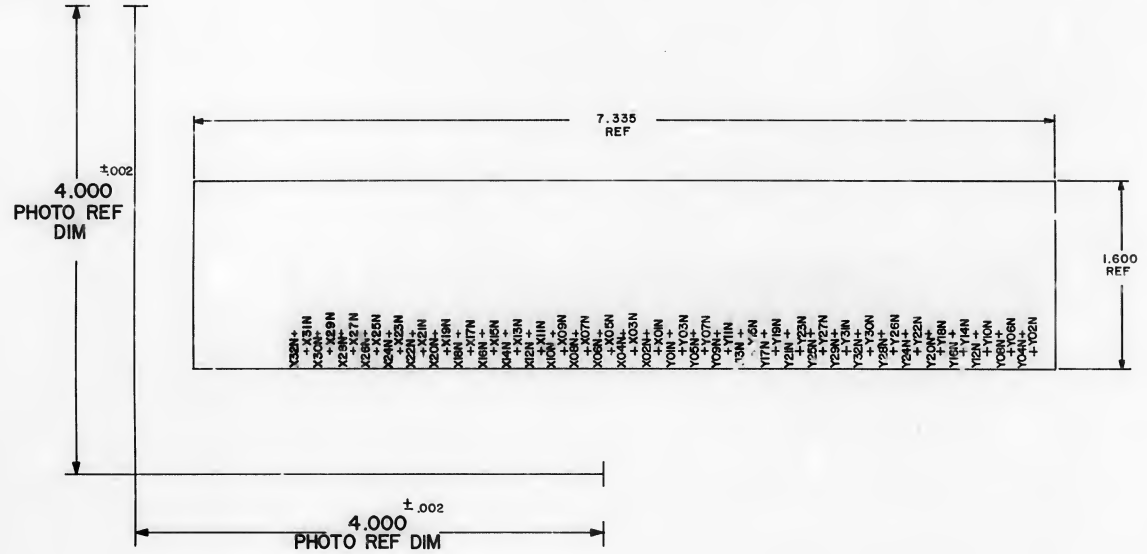
DRAWN JC Conley DATE 2-8-62
CHECKED [illegible] 4/1/62
APPROVAL [illegible] 28 JUNE 63
APPROVAL [illegible] 29 JUNE 63
NASA APPROVAL [illegible] 9-20-64
MIT APPROVAL [illegible] 9-30-63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FEED THRU TERMINAL PLATE

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	D	1004090
SCALE 2:1	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00309 DATE 30 Jan 1963

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATION SHALL NOT EXCEED .001 INCH PER INCH
3. MAKE MASTER PATTERN POSITIVE FILMS TO DIMENSIONS SHOWN
4. MATERIAL: .007 (COULD VARY) THICK PLASTIC SHEETS, SENSITIZED, DIMENSIONALLY STABLE PER L-P-[illegible] (NAVY-AER) TYPE II, CLASS "C"

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± 1/2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 4
HEAT TREATMENT —#—
FINAL FINISH —#—
NEXT ASSY | USED ON
APPLICATION

M I T INSTRUMENTATION LAB Cambridge, Mass.
DWG NO. CONTRACT

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

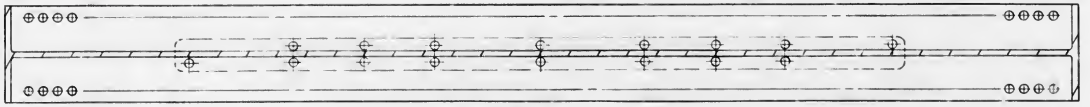
DRAWN DATE 12/26/62
CHECKED 1/28/63
APPROVAL
APPROVAL 2/1/63
NASA APPROVAL 1-30-63
MIT APPROVAL 1/30/63

SILK SCREEN MASTER
ERASABLE MEMORY STICK

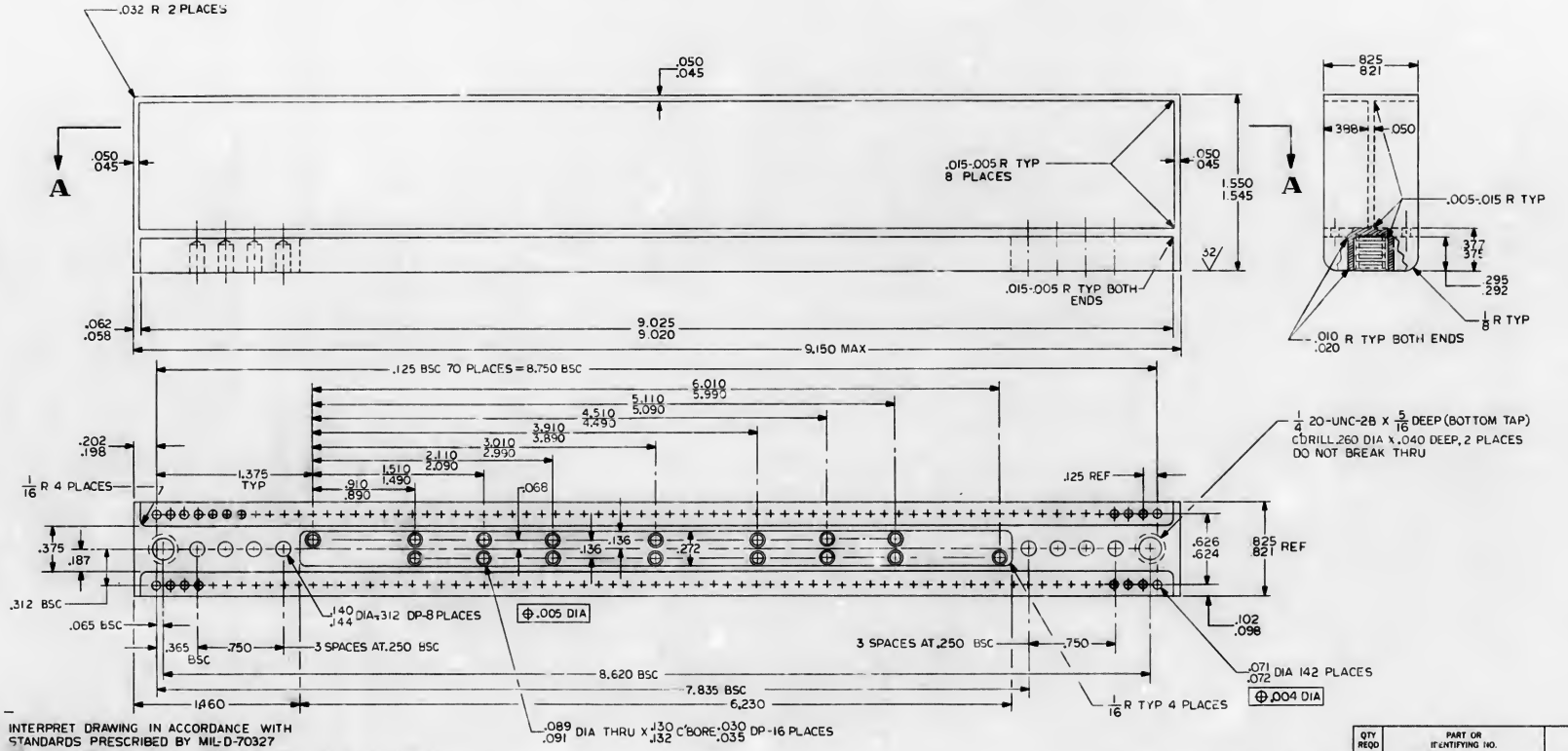
CODE IDENT NO | SIZE D | NASA DRAWING NO. 1004093
SCALE 2/1 | WT | SHEET 1 OF 1

1004093

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED AND UPGRADED TO CLASS A PER TORR 00908	11/4/63	WHT GJR



SECTION **A-A**



NOTES:—

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL — MAG. ALLOY EZ33A-T5 PER QQ-M-55A, COMP EZ33A, TEMPER T5
3. FINISH — GALVANIC ANODIZE PER MIL-M-3171A TYPE IV
4. ALL SURFACES 125 UNLESS OTHERWISE SPECIFIED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±-H	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG. NO. CONTRACT
		DO NOT SCALE THIS DRAWING	DRAWN DATE 10-29-63
		MATERIAL SEE NOTE 2	CHECKED DATE 11/4/63
		HEAT TREATMENT -H	APPROVAL DATE 11/4/63
1003075		FINAL FINISH SEE NOTE 3	APPROVAL DATE 11/4/63
NEXT ASSY	USED ON		NASA APPROVAL DATE 11/4/63
APPLICATION			MIT APPROVAL DATE 11/4/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

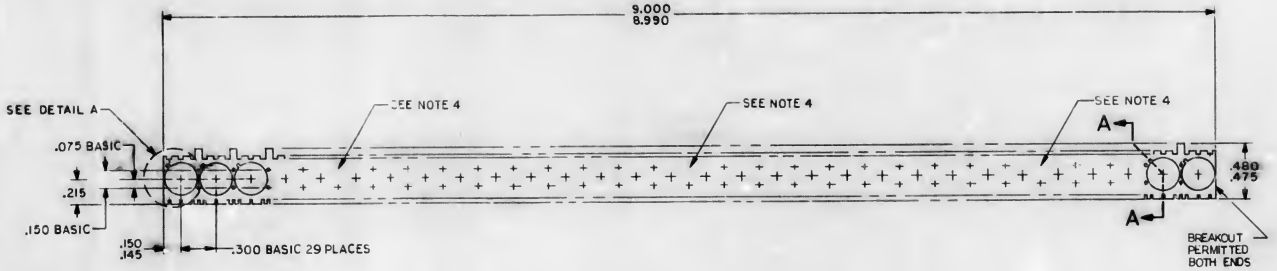
HEADER HOUSING
MICRO LOGIC STICK

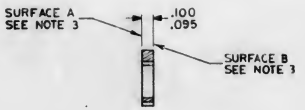
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	D	1004094

SCALE 2/1 | WT -H | SHEET 1 OF 1

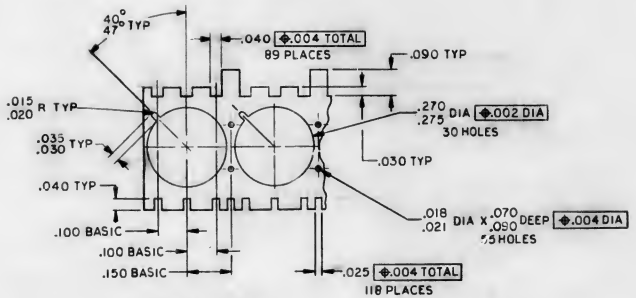
1004094 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A PER TDRR 00909	11-11-63	WR
B	REVISED PER TDRR 04837	10-1-64	WR
C	REVISED PER TDRR 04907	10-14-63	WR
D	REVISED PER TDRR 04606	11-12-63	WR
E	REVISED PER TDRR 07833 DR 2274 CHK JGA	4/1/64	WR





SECTION A-A



DETAIL A
SCALE 5/1

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MAT'L: PLASTIC, CLEAR, ACRYLIC PER MIL-P-8184 FINISH B-ALT MIL-P-5425 FINISH B
3. SURFACES A AND B TO BE DULL FINISH
4. NO .017 .021 HOLES AT THESE LOCATIONS
5. NO BREAKOUTS PERMITTED EXCEPT WHERE INDICATED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

1003082	
1003081	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
.005
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DRAWN DATE 10-24-62
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL 11-13-63

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

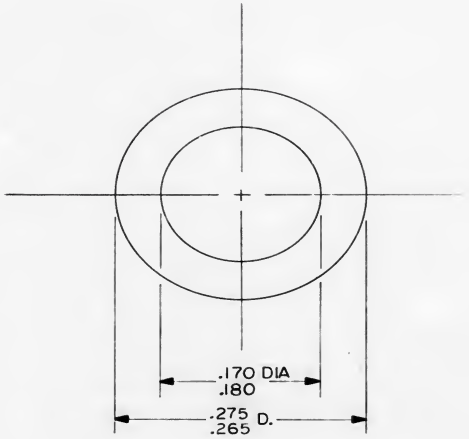
HOUSING MICRO LOGIC TO 47

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1004095
SCALE 2/1
WT
SHEET 1 OF 1

MASTER

A 1004098 A

REVISIONS CLASS B TDRR 00514			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED AND UP GRADED TO CLASS A PER TDRR 00910	6 MAR 63	WJF WH



NOTES:

1. INTERPRET IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL D 70237
2. MATERIAL: .003/.005 PLASTIC SHEET PER L-P-00519 TYPE 2, CLASS 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003079	—
1003080	—
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [signature] DATE 2/20/63
CHECKED D.E. Sommer 3/1/63
APPROVAL W.R. Turner 3/1/63
APPROVAL [signature] 3/1/63
NASA APPROVAL Jack Bannon
MIT APPROVAL WJF [signature] 3/6/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

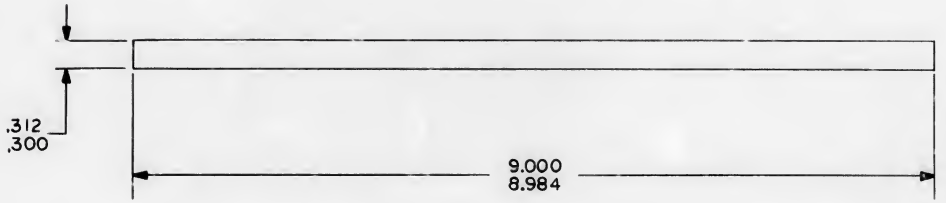
WASHER, MYLAR
(MICRO LOGIC STICK)

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1004098
SCALE 10 X | WT | SHEET 1 OF 1

1004098 A

1004099

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00514 DATE 6 Jun 63

NOTES:

1. INTERPRET THIS DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: .015 THICK GLASS EPOXY BOARD / MIL-P-18177 TYPE GEB

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003080	
1003079	—
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —"—
FINAL FINISH —"—

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

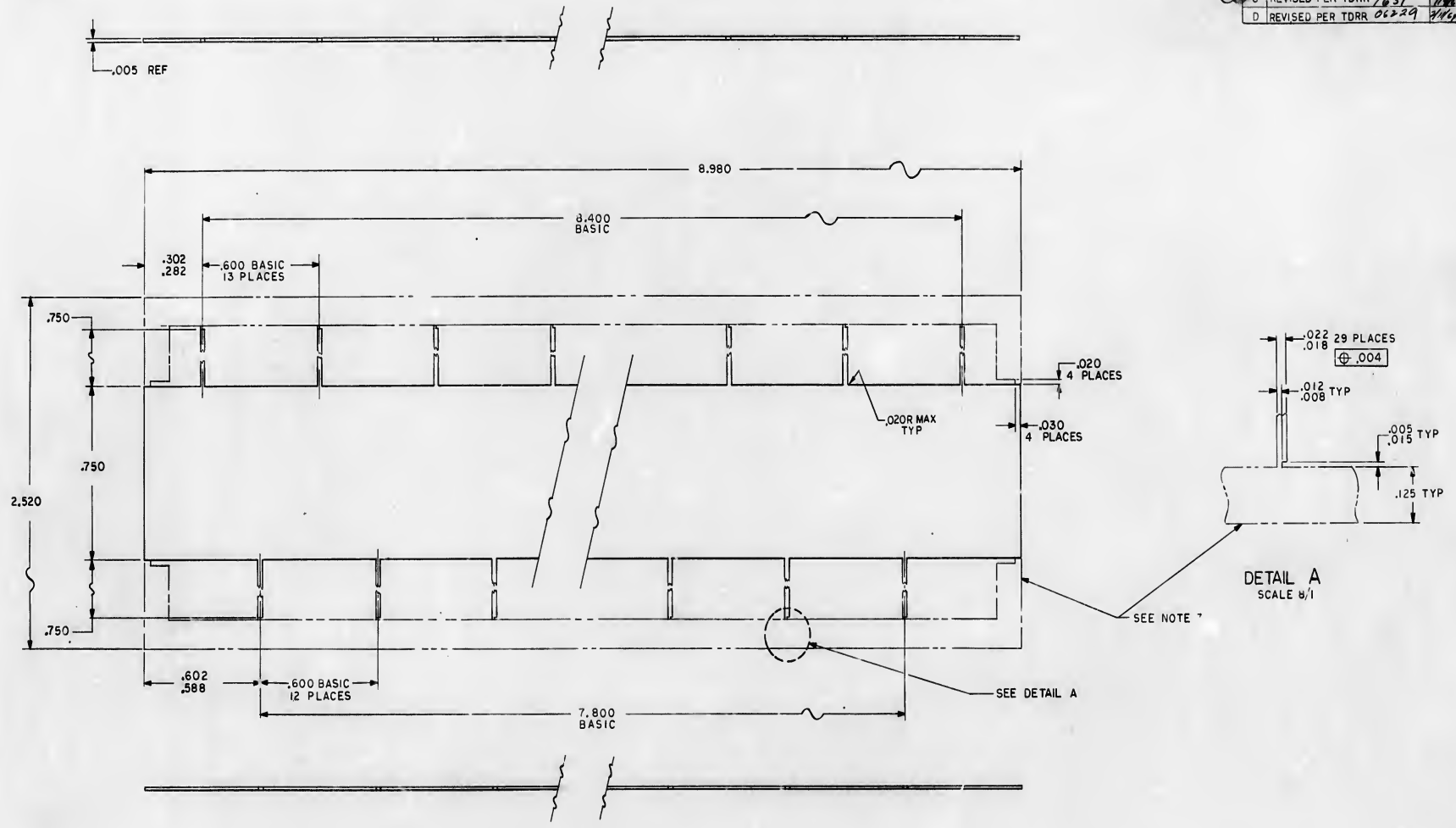
DRAWN [signature] DATE 3/6/63
CHECKED [signature] 3/7/63
APPROVAL [signature] 3/15/63
APPROVAL [signature] 3/11/63
NASA APPROVAL [signature]
MIT APPROVAL [signature] 6 Jun 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

STRIP, BACKING
MICRO LOGIC STICK

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1004099
SCALE 1 - 1 | WT | SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR00672	5/23/63	
B	UPGRADED TO CLASS A PER TDRR 00905	6/28/63	
C	REVISED PER TDRR 1631	9/26/63	
D	REVISED PER TDRR 06229	7/14/67	



NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: .005 NICKEL PER MIL-N-46025, ANNEALED; ALT MAT'L HUNTINGTON ALLOY # 204 NICKEL
3 PHANTOM LINES DEFINE BORDER TO BE REMOVED AT ASSEMBLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003082	
1003081	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.010 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DWG — CONTRACT
DRAWN DATE 2/21/63
CHECKED 2/14/63
APPROVAL 3/5/63
APPROVAL 7/1/63
NASA APPROVAL
MIT APPROVAL

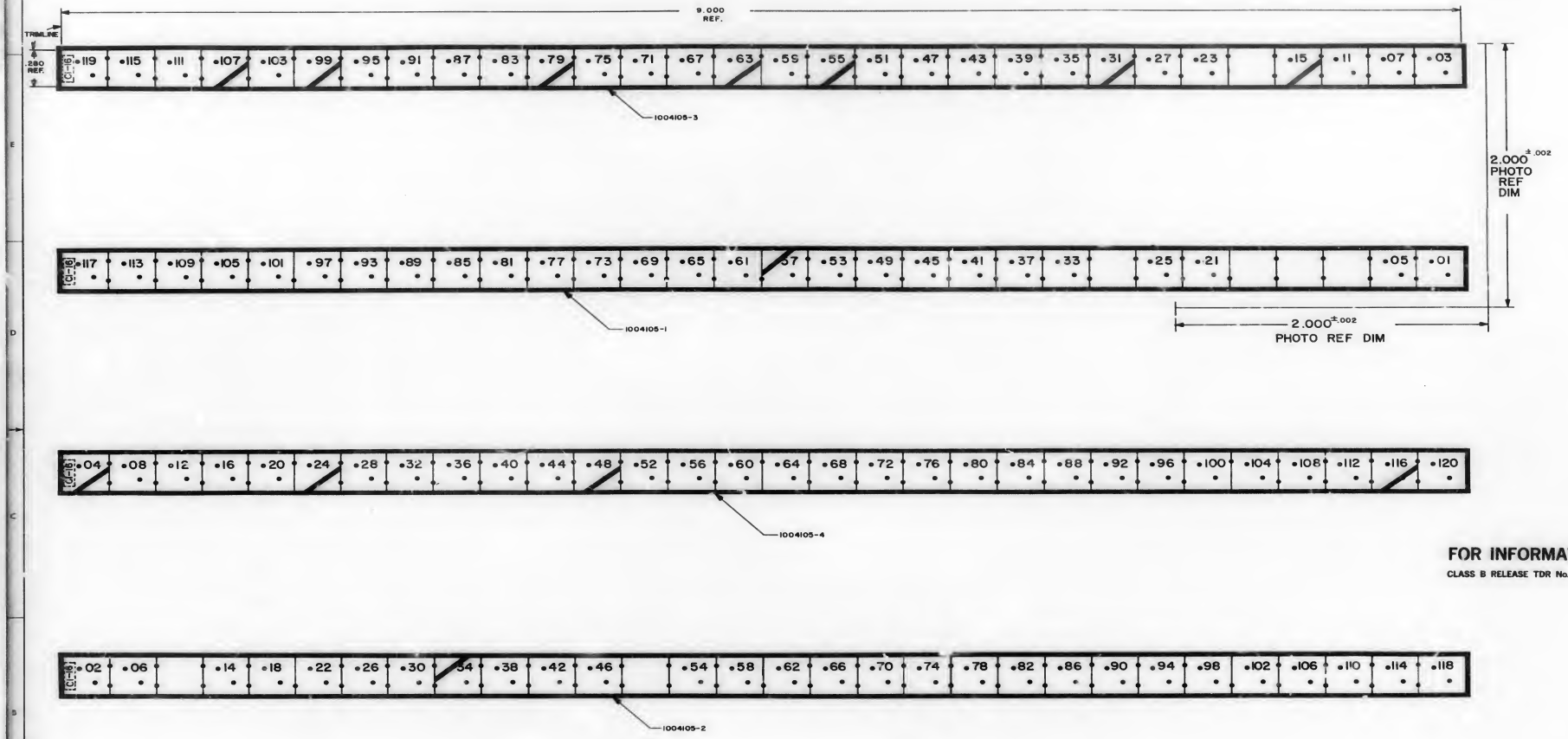
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GROUND PLANE LOGIC MODULE

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1004100
SCALE 4/1
WT
SHEET 1 OF 1

MASTER

1004100



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00514 DATE 6 Jan 63

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY ME-0-70327.
2. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS SHALL NOT EXCEED .001 INCH PER INCH.
3. MAKE MASTER PATTERN POSITIVE FILMS TO DIMENSIONS SHOWN
4. CUT TO WITHIN .010 OF TRIMLINE
5. MATERIAL: .006/.008 THICK PLASTIC SHEETS, SENSITIZED, DIMENSIONALLY STABLE PER L-P-00818 (NAVY AER) TYPE II, CLASS "C"
6. ⊕ PUNCH HOLES TO .040 DIAMETER

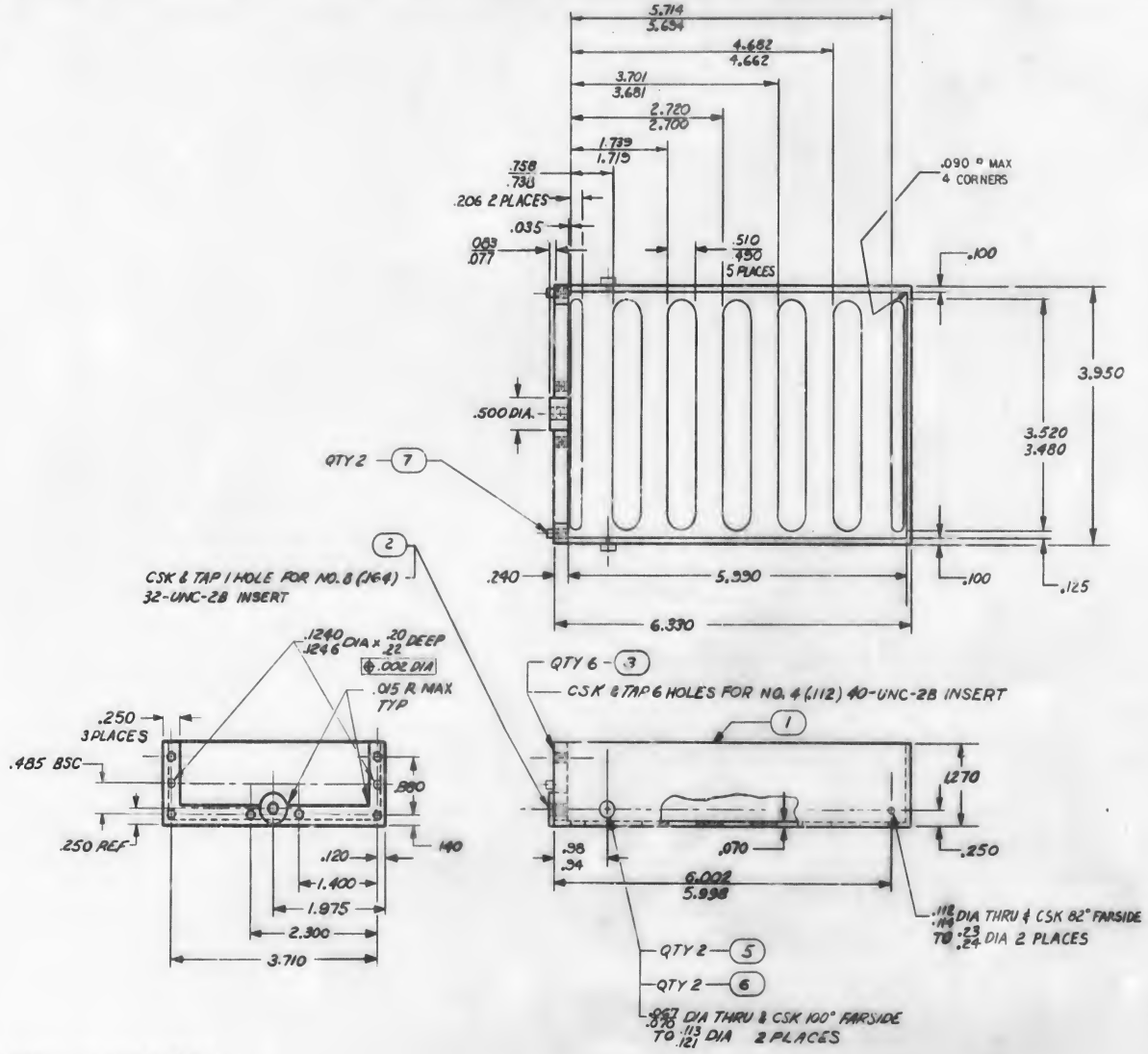
REVISIONS			
LTR	DESCRIPTION	DATE	APPROVAL
A	PER TDR 00477	6Jan63	

QTY REQ	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1°	M.I.T. INSTRUMENTATION LAB CAMBRIDGE, MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
	DO NOT SCALE THIS DRAWING	DRAWN [illegible] DATE 2/6/63	MYLAR MASTER INSULATOR, STICK ARITHMETIC STICK NO. C1-16
	MATERIAL SEE NOTE 5	CHECKED [illegible]	
	HEAT TREATMENT —	APPROVAL [illegible]	
	FINAL FINISH —	APPROVAL [illegible]	
NEXT ASSY USED ON		NASA APPROVAL [illegible]	CODE IDENT NO. E SIZE NASA DRAWING NO. 1004105
APPLICATION		MIT APPROVAL [illegible]	SCALE 4/1 WT SHEET 1 OF 1

1004105 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
C	REDRAWN REPLACES REV B WITH CHANGE AND UPDATED TO CLASS A PER TDRR 02901	7-5-67	
D	REVISED PER TDRR 04311	11-20-67	
E	REVISED PER TDRR 04513	1-8-68	
F	REVISED PER TDRR 07347 DR CHK	5/10/68	
G	REVISED PER TDRR 12575 DR CHK	9/27/68	



NOTES

1. MATL MAKE FROM DWG NO 1004562

2. MACHINE ALL SURFACES 125
4. ANODIZE PER MIL-A-8625 TYPE I DYED BLACK
3. REMOVE ALL BURRS & SHARP EDGES

SEE NOTE 1

© REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
2	AN122691	PIN DOWELL	7
2	MS20426AE-6	RIVET	6
2	1004118	PIN GUIDE	5
			4
6	MS21209-C0415	INSERT, SCREW THREAD, LOCKING	3
1	MS21209-C0815	INSERT, SCREW THREAD, LOCKING	2
1	1004113-1	HOUSING, RELAY MODULE	1

LIST OF MATERIALS

1003098	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE 4

MIT INSTRUMENTATION LAB
Cambridge, Mass.

DRAWN D. Mc Kay DATE 11/1966
CHECKED R. Piccirilli 2-6-68
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEADER ASSEMBLY RELAY MODULE

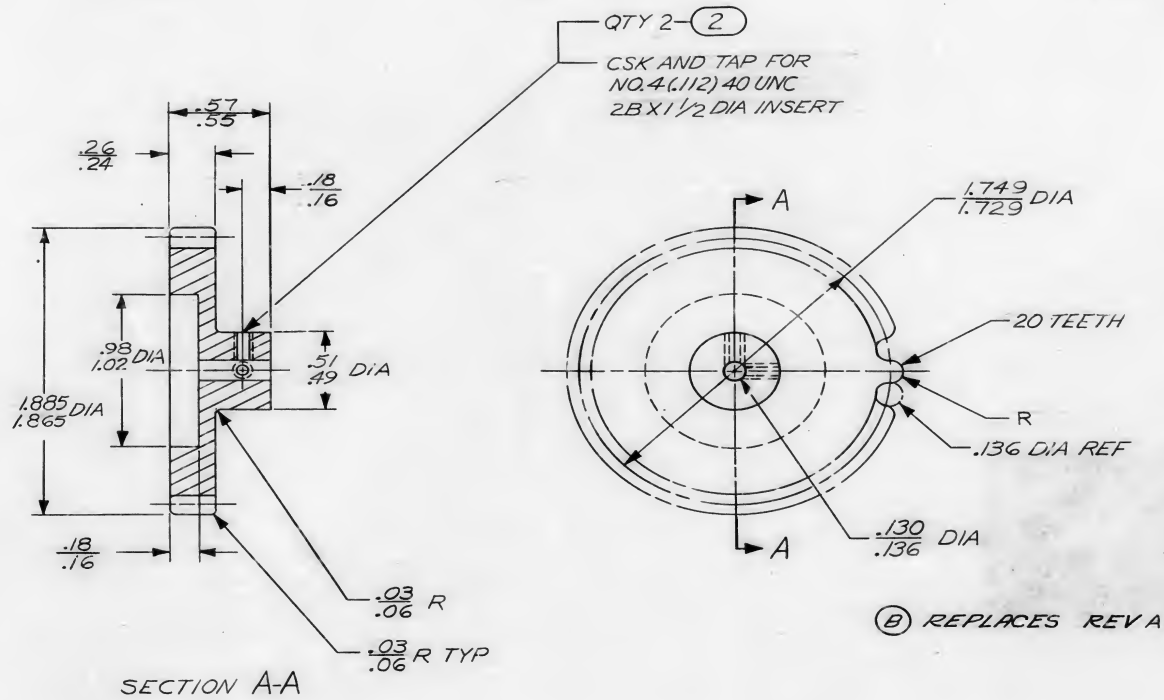
AGC DSKY NAV & MAIN

CODE IDENT NO —— SIZE D NASA DRAWING NO. 1004113
SCALE 1/1 WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1004114 C

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN REPLACES REV A WITH CHANGE PER TDRR 03454	7/24/63 9-26-63	
C	REVISED PER TDRR 04029	10-10-63	



SECTION A-A

(B) REPLACES REV A WITH CHANGE

NOTES

1. MATL: 6061-T6 AL PER QQ-A-325, TEMPER T6
2. REMOVE ALL BURRS AND SHARP EDGES
3. MASK TAPPED HOLES AND THRU HOLE AND ANODIZE PER MIL-A-8625 TYPE I (CHROMIC ACID) DYED MEDIUM GREY PER FED STD-TT-C-595, COLOR CHIP NO. 26440
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
5. INSTALL FIND NO. 2 PER MS33646-BREAK OFF DRIVING TANG
6. COAT THREADS AND FIND NO. 2 WITH MIL-P-8585, WET ZINC CHROMATE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
2	MS 21209-C0415	INSERT, SCREW THREAD LOCKING	2
1	1004114-1	THUMB WHEEL	1

LIST OF MATERIALS

1003524	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 1
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTE 3

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. / CONTRACT
DRAWN [illegible] DATE 6 Sept 63
CHECKED [illegible] 6 Sept 63
APPROVAL [illegible] Sept 10 63
APPROVAL [illegible] 9 SEP 63
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL [illegible] 10/2/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

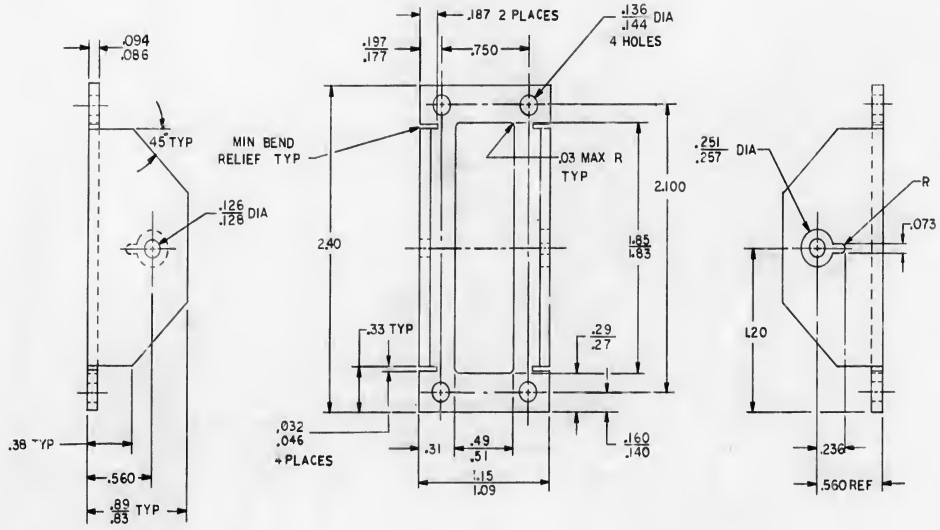
THUMB WHEEL
AGC DISPLAY AND KEYBOARD

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004114
SCALE 2/1	WT	SHEET 1 OF 1

POSTER

SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TORR 03453	17 Oct 63	WK
C	CHANGED PER TORR 04040	7 Nov 63	WK
D	CHANGED PER TORR 05039 CR#	10 Dec 63	WK

(M) INITIAL CLASSIFIED BY TORR 01298 REVISIONS 03453 / ERROR



(B) REPLACES REV A WITH CHANGES (17 Oct 63) (TORR 01298)

NOTES

1. MATL 5052-H32 ALUMINUM PER QQ-A-318 TEMPER H32
2. REMOVE BURRS AND SHARP EDGES
3. SURFACE QUALITY 125
4. ANODIZE PER MIL-A-8625 TYPE II DYED BLACK
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. ALL BEND RADII TO BE .06

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ±.02 .005 ANGLES ± 5°	
DO NOT SCALE THIS DRAWING	
MATERIAL	SEE NOTE 1
HEAT TREATMENT	NONE
FINAL FINISH	SEE NOTE 4
1003524	
NEXT ASSY / USED ON	
APPLICATION	

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS. DWG. NO. CONTRACT

DRAWN [signature] DATE 17 SEP 63
CHECKED [signature] 17 Sep 63
APPROVAL [signature] Sept 19 1963
APPROVAL [signature] 19 Sept 63
NASA APPROVAL [signature] 12/4/63
MIT APPROVAL
MIT APPROVAL [signature] 12/4/63 12/11/63

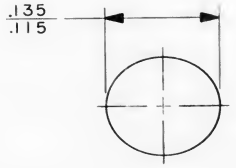
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

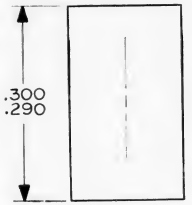
BRACKET, POTENTIOMETER
AGC DSKY, NAV & MAIN

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1004116
SCALE 2/1
WT
SHEET 1 OF 1

1004117

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL





FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 00896 DATE 4-17-63

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: MAGNESIUM, ZK60A-T5 PER QQ-M-31
3. FINISH: GALVANIC ANODIZE PER MIL-M-3171A TYPE IV,
4. BREAK SHARP CORNERS .005/.015

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003061	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ± 2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT
FINAL FINISH SEE NOTE 3

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 4-15-63
CHECKED C.P. Kogabuny 15 APR 63
APPROVAL W.B. Turner 16 APR 63
APPROVAL
NASA APPROVAL [illegible]
MIT APPROVAL W. Kuffa 17 Apr 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

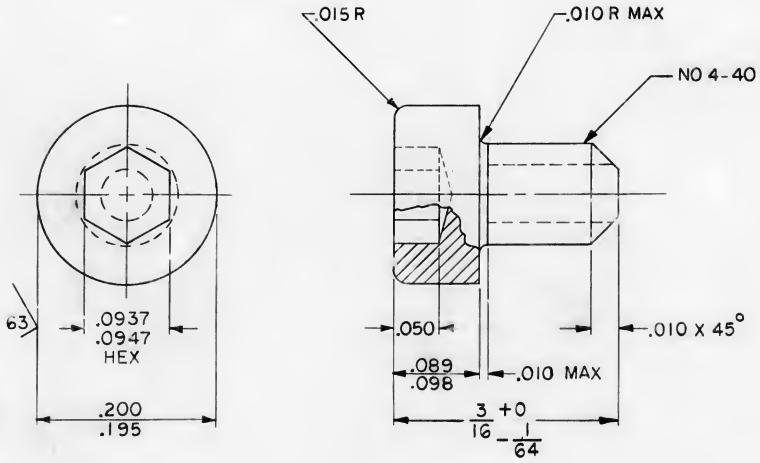
PLUG, KEYING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004117
SCALE 10/1	WT	SHEET 1 OF 1

1004117

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED AND UPGRADED TO CLASS A PER TDRR 02901	3-17-65	

A 1004118



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01298 DATE 5-22-63

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MAT'L: 303 CRES PER QQ-S-763B-1
3. REMOVE ALL BURRS & SHARP EDGES
4. PASSIVATE PER MIL-F-14072
5. 125 ALL OVER, UNLESS OTHERWISE SPECIFIED

REV A REPLACED BY REV B
OBSOLETE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1/2°
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE 2

HEAT TREATMENT: —

FINAL FINISH: SEE NOTE 4

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Tony Gibson DATE 15 APR 63
CHECKED J. F. Murphy 5-14-63
APPROVAL W. C. Turner 22 MAY 63
APPROVAL [signature] 5-22-63
NASA APPROVAL [signature] 5-22-63
MIT APPROVAL [signature] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

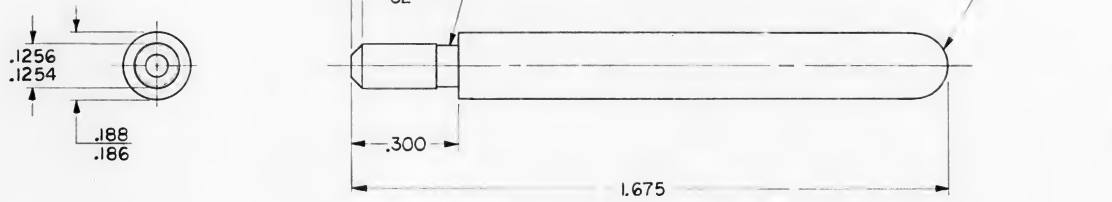
GUIDE STUD
(AGC KEYBOARD)

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1004118

SCALE 10/1 | WT | SHEET 1 OF 1

1004120

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01298 DATE 5-22-63

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MAT'L: 303 SST PER QQ-S-763B-1
3. REMOVE BURRS & BREAK ALL SHARP EDGES
4. PASSIVATE PER MIL-F-14072
5. 63 ALL OVER, UNLESS OTHERWISE SPECIFIED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± 1/64 DECIMALS ±.005 ANGLES ± 1/2
DO NOT SCALE THIS DRAWING

MATERIAL: SEE NOTE 2

HEAT TREATMENT: —

FINAL FINISH: SEE NOTE 4

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Tom Killeen DATE 17 APR 63
CHECKED [signature] 5-13-63
APPROVAL W S Summer 22 MAY 63
APPROVAL
NASA APPROVAL W S Summer 5/22/63
MIT APPROVAL L Nafzl 5/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GUIDE PIN
(AGC KEYBOARD)

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004120
SCALE 4/1	WT	SHEET 1 OF 1

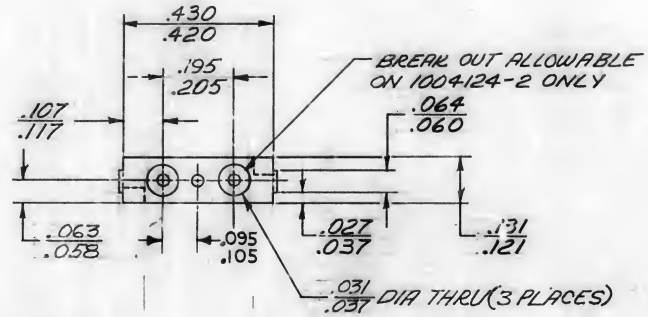
1004120

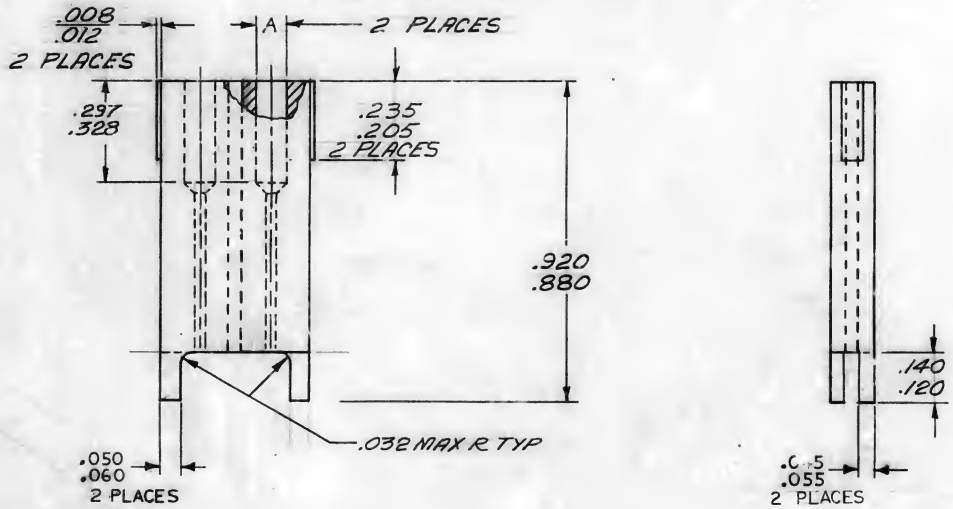
NOTICE — WHEN GOVERNMENT DRAWINGS, SPECIFICATIONS, OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE UNITED STATES GOVERNMENT THEREBY INCURS NO RESPONSIBILITY NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE, OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

A DIM.	PART NO.
.081/.086 DIA	1004124-1
.099/.104 DIA	1004124-2

1004124 B

REVISIONS				
	SYM	DESCRIPTION	DATE	APPROVAL
(M)	—	CLASS A RELEASE PER TDRR 02918	9/6/63	
(N)	A	REVISED PER TDRR 04485	11-5-63	
	B	REVISED PER TDRR 04735	4-29-63	





NOTES

1. MATL: PLASTIC SHEET ACRYLIC PER MIL-P-8184, FINISH B, OR MIL-P-5425B FINISH B
2. REMOVE SHARP EDGES
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1003098	
NEXT ASSY	USED ON
APPLICATION	

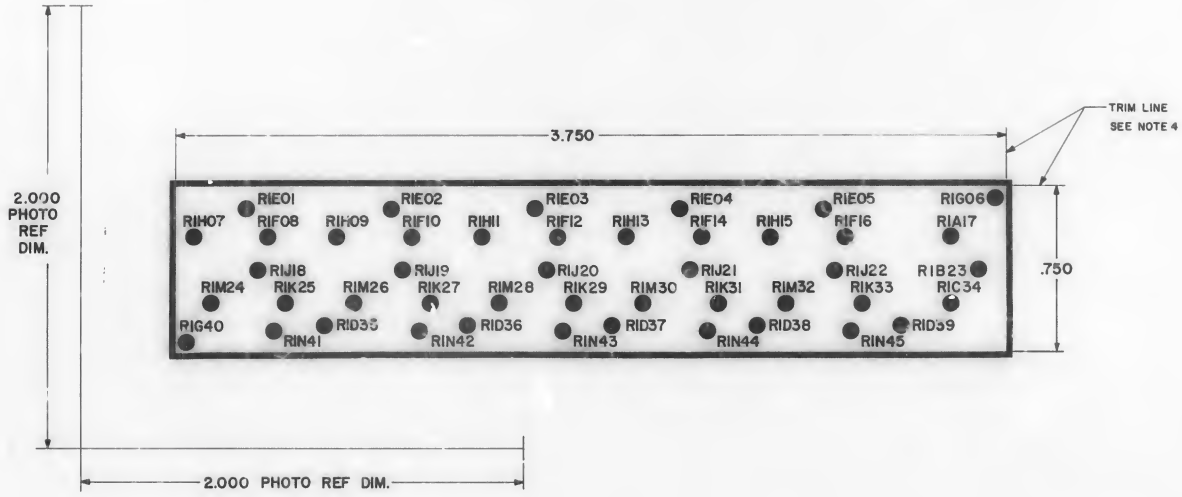
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN D.D. Chapman DATE 21 AUG 63
CHECKED R.E. Duval 27 Aug 63
APPROVAL E.J. Shannon 6 Sept 63
APPROVAL Allan C. Hall 6 Sept 63
NASA APPROVAL H. Michael 9/6/63
MIT APPROVAL
MIT APPROVAL D. Wahl 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BLOCK, DIODE RELAY MODULE AGC DSKY, NAV & MAIN

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1004124
SCALE 4/1	WT	SHEET 1 OF 1



NOTES:
1. MATERIAL..006/.008 THICK PLASTIC SHEET SENSITIZED DIMENSIONALLY STABLE PER L-F-340, TYPE I6, CLASS 2, STYLE I A
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL STABILITY SHALL NOT EXCEED .001 INCH PER FOOT.
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER NEGATIVE AND POSITIVE TO DIMENSIONS SHOWN
6. ● .078/.082 DIA PUNCH ALL HOLES

Ⓐ REPLACED WITH CHANGE BY REV B

INACTIVE

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
A	REPLACED WITH CHANGE PER TDRR 6171	1-18-67	

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
.XXX ±.020' ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT
FINAL FINISH
1003824
NEXT ASSY USED ON
APPLICATION

MIT INSTRUMENTATION LAB
Cambridge Mass.
DRAWN Jerry Sachs DATE 9 Jan 63
CHECKED Charles Stark
APPROVAL Richard Battin
APPROVAL E Eckhardt 21 Jan 63
NASA APPROVAL Hal Laurie 1/24/63
MIT APPROVAL [illegible] 1/24/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PHOTOGRAPHIC MASTER DISPLAY REGISTER NO.1 AGC KEYBOARD

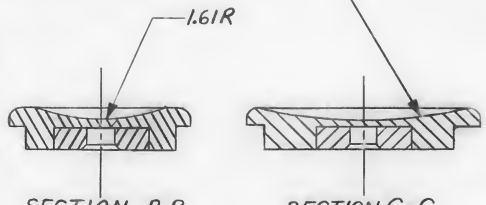
CODE IDENT NO —
SIZE E
NASA DRAWING NO 1004126
SCALE 8/1
WT
SHEET 1 OF 1

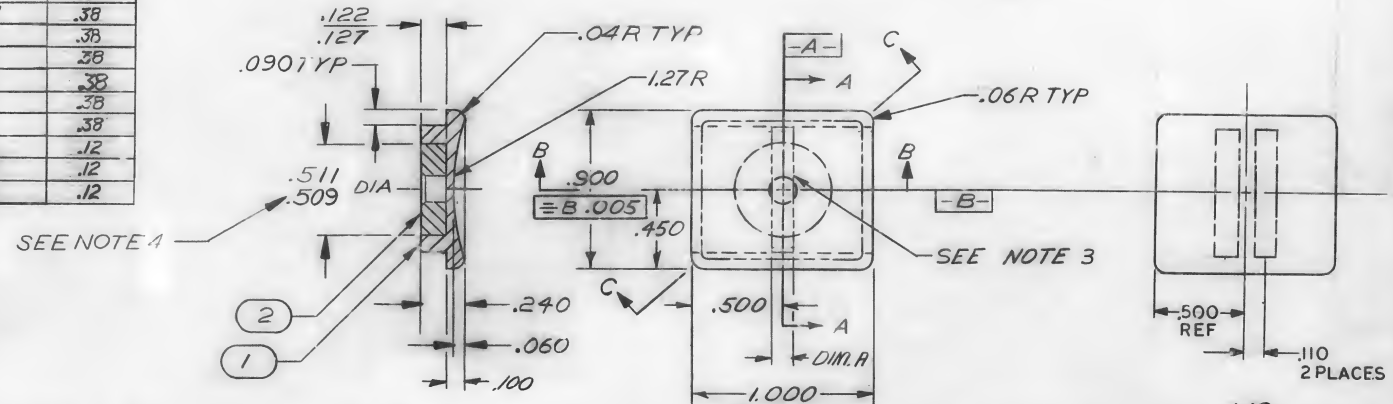
1004126 A

REVISIONS 03107			
SYM	DESCRIPTION	DATE	APPROVED
(M) B	~~REPLACES~~ REV ~~K~~ A WITH CHANGE PER TDRR 03107 (Rev A was never released)	7-3-63	WJK
C	REVISED AND UPGRADED TO CLASS A PER TDRR 04169	10-31-63	EPK

RADII TO BLEND TO CORNER AS INDICATED BY PHANTOM LINE

PART NO	ENGRAVING	VIEW	DIM A
1004127-1	CLEAR	1	.12
1004127-2	VERB	1	.12
1004127-3	NOUN	1	.12
1004127-4	ENTER	1	.12
1004127-5	+	1	.38
1004127-6	7	1	.38
1004127-7	8	1	.38
1004127-8	9	1	.38
1004127-9	–	1	.38
1004127-10	4	1	.38
1004127-11	5	1	.38
1004127-12	6	1	.38
1004127-13	0	1	.38
1004127-14	1	1	.38
1004127-15	2	1	.38
1004127-16	3	1	.38
1004127-17	TEST ALARM	2	.12
1004127-18	ERROR RESET	2	.12
1004127-19	KEY RLSE	2	.12





NOTES:
1. MATL: NYLON PER MIL-P-17091 TYPE I COLOR WHITE PER FED-STD-595 CHIP NO. 37875
2. REMOVE SHARP EDGES
3. ENGRAVE CHARACTERS .010/.016 DEEP PER ND1002019, EXCEPT STYLE FUTURA DEMIBOLD PER ND 1002122. FILL FLUSH TO TOP SURFACE WITH MATERIAL PER ND1002130, COLOR BLACK PER FED-STD-595 CHIP NO. 37038 CENTRALLY LOCATED
4. INDICATED DIMENSION NOT TO APPLY WHEN ASSEMBLY IS TO BE MOLDED

(B) REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
1	1004159	INSERT, BUTTON	2
1	SEE TABLE	BUTTON, KEYBOARD	1

LIST OF MATERIALS

1003539	
1003097	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.02 ANGLES ± ±.005
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN DQ Chmielewski DATE 7-26-63
CHECKED [illegible] Aug 13 63
APPROVAL WJK Turner 12 SEP 63
APPROVAL [illegible]
APPROVAL
NASA APPROVAL [illegible] 9-11-63
MIT APPROVAL
MIT APPROVAL [illegible] 12 Sep 63

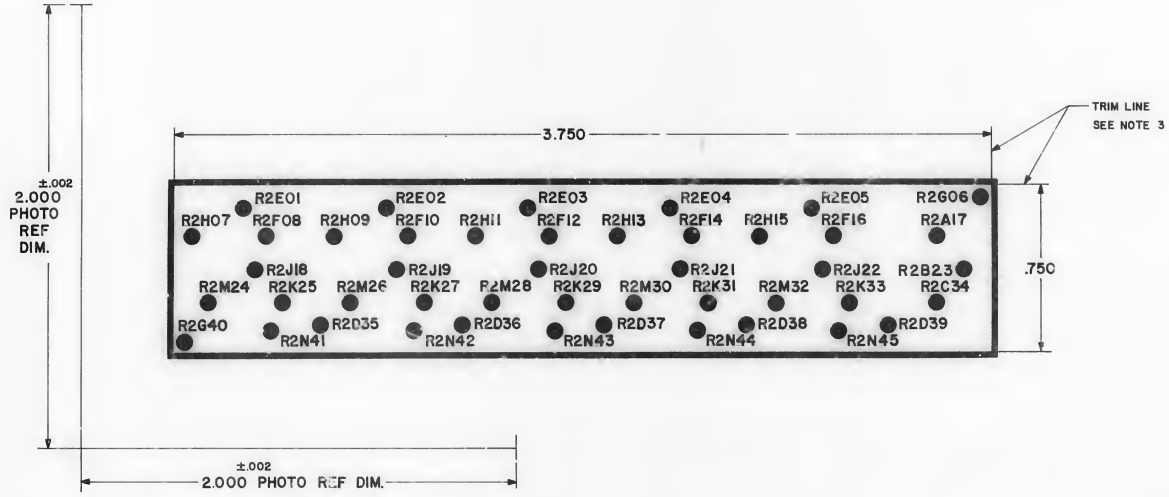
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BUTTON, KEYBOARD
AGC DSKY, NAV & MAIN

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004127
SCALE 2/1	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REPLACED WITH CHANGE PER TDRR 6477	1-24-67	MF	



(A) REPLACED WITH CHANGE BY REV B

INACTIVE

NOTES:
1. MATERIAL: .006/.008 THICK PLASTIC SHEET, SENSITIZED, DIMENSIONALLY STABLE PER L-F-340, TYPE 1B, CLASS 2, STYLE 1A
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL ENSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS SHALL NOT EXCEED .001 INCH PER FOOT.
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER NEGATIVE AND POSITIVE FILMS TO DIMENSIONS SHOWN
6. ● .078/.082 DIA PUNCH ALL HOLES

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

1003624		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS .XX ±.02 .XXX ±.010 ANGLES ±1° DO NOT SCALE THIS DRAWING MATERIAL SEE NOTE 6 HEAT TREATMENT — FINAL FINISH —	MIT INSTRUMENTATION LAB Cambridge Mass. DRAWN F. Ramos DATE 6-17-63 CHECKED [illegible] APPROVAL [illegible] APPROVAL [illegible]
NEXT ASSY	USED ON		NASA APPROVAL [illegible]
APPLICATION			MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

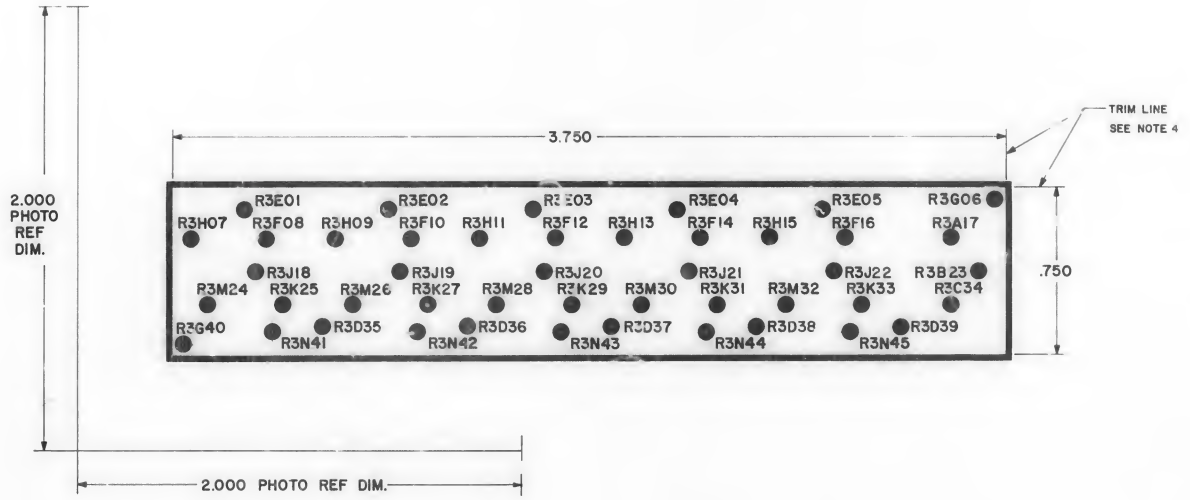
PHOTOGRAPHIC MASTER DISPLAY REGISTER NO.2 AGC KEYBOARD

CODE IDENT NO	SIZE	NASA DRAWING NO
	E	1004128

SCALE 5/1 WT SHEET 1 OF 1

1004128 A

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVAL
A	REPLACED WITH CHANGE PER TDRR		



(A) REPLACED WITH CHANGE BY REV B

INACTIVE

NOTES

1. MATERIAL: .006/.008 THICK PLASTIC SHEET, SENSITIZED, DIMENSIONALLY STABLE PER L-F-340, TYPE IB, CLASS 2, STYLE IA
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS SHALL NOT EXCEED .001 INCH PER FOOT.
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER NEGATIVE AND POSITIVE FILMS TO DIMENSIONS SHOWN
6. ⊕ .078/.082 DIA PUNCH ALL HOLES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS .010 ANGLES DO NOT SCALE THIS DRAWING	
		MATERIAL SEE NOTE 1	
1003524		HEAT TREATMENT	
NEXT ASSY	USED ON	FINISH	
APPLICATION			

MIT INSTRUMENTATIC LAB
Cambridge, Mass.

DRAWN		DATE
CHECKED		DATE
APPROVAL		DATE
APPROVAL		DATE
NASA APPROVAL		DATE
MIT APPROVAL		DATE

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

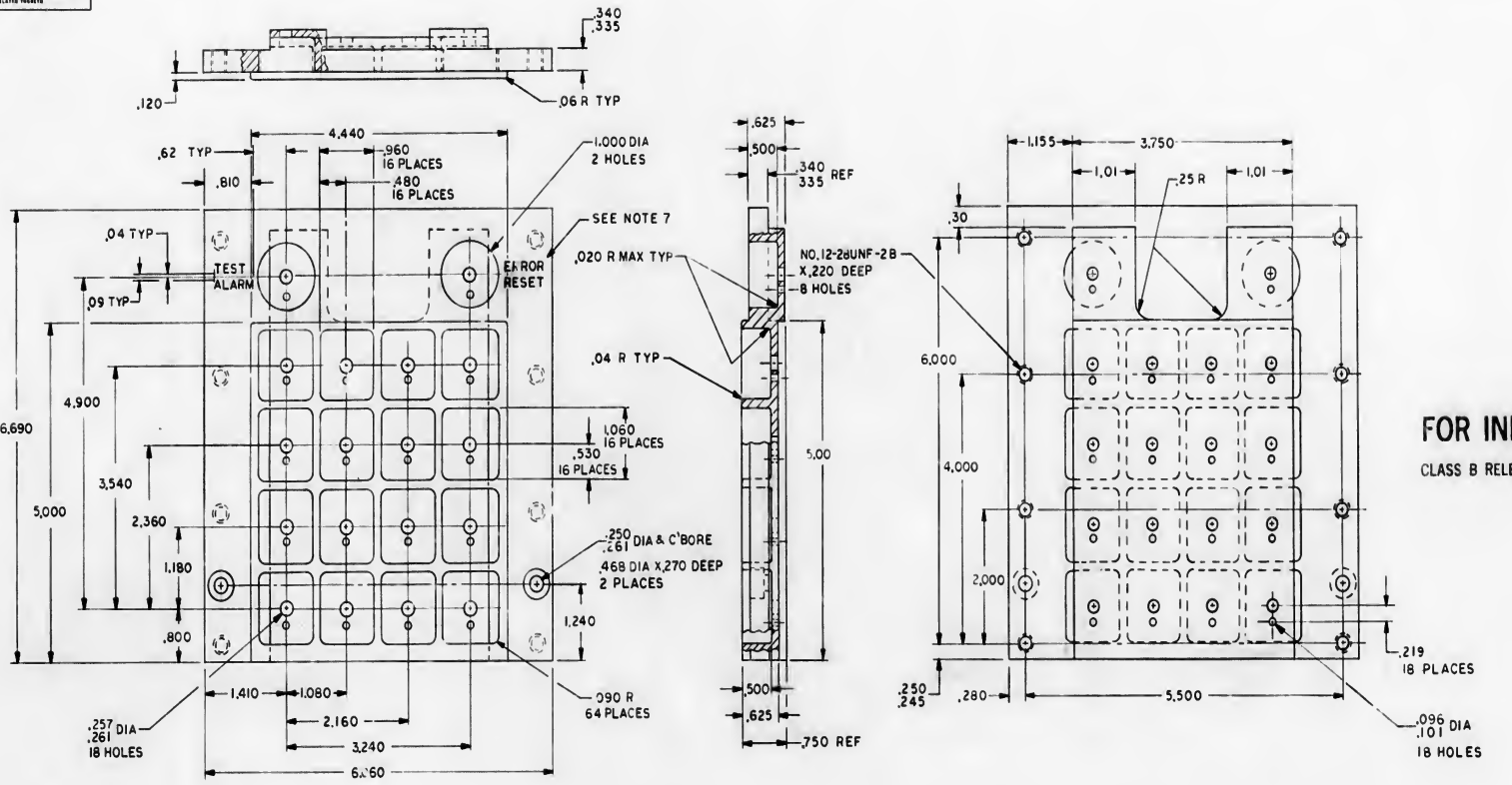
PHOTOGRAPHIC MASTER DISPLAY REGISTER NO.3
AGC KEYBOARD

CODE IDENT NO	SIZE	NASA DRAWING NO
—	E	1004129

SCALE 8/1 WT SHEET 1 OF 1

1004129

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FRONT VIEW

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01298 DATE 5-22-63

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. MATERIAL: .750 THK ALUMINUM PER QQ-A-327, TEMP-T6
3. 125/ALL OVER
4. REMOVE BURRS AND SHARP EDGES
5. ANODIZE PER MIL-A-8625 TYPE II DYED BLACK
6. MASK ALL THRU HOLES
7. SILKSCREEN .125 HIGH CHARACTERS PER ND1002019
8. PAINT FRONT AND TWO SIDES MEDIUM GRAY PER FED STD 595-26231

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS .005 ANGLES ±02
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 2
HEAT TREATMENT:
FINAL FINISH: SEE NOTES 5 & 8

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO. | CONTRACT

DRAWN [illegible] DATE 5-14-63
CHECKED [illegible] 5-14-63
APPROVAL [illegible] 23 MAY 63
APPROVAL

NASA APPROVAL [illegible] 5/23/1963
MIT APPROVAL [illegible] 5/24/63

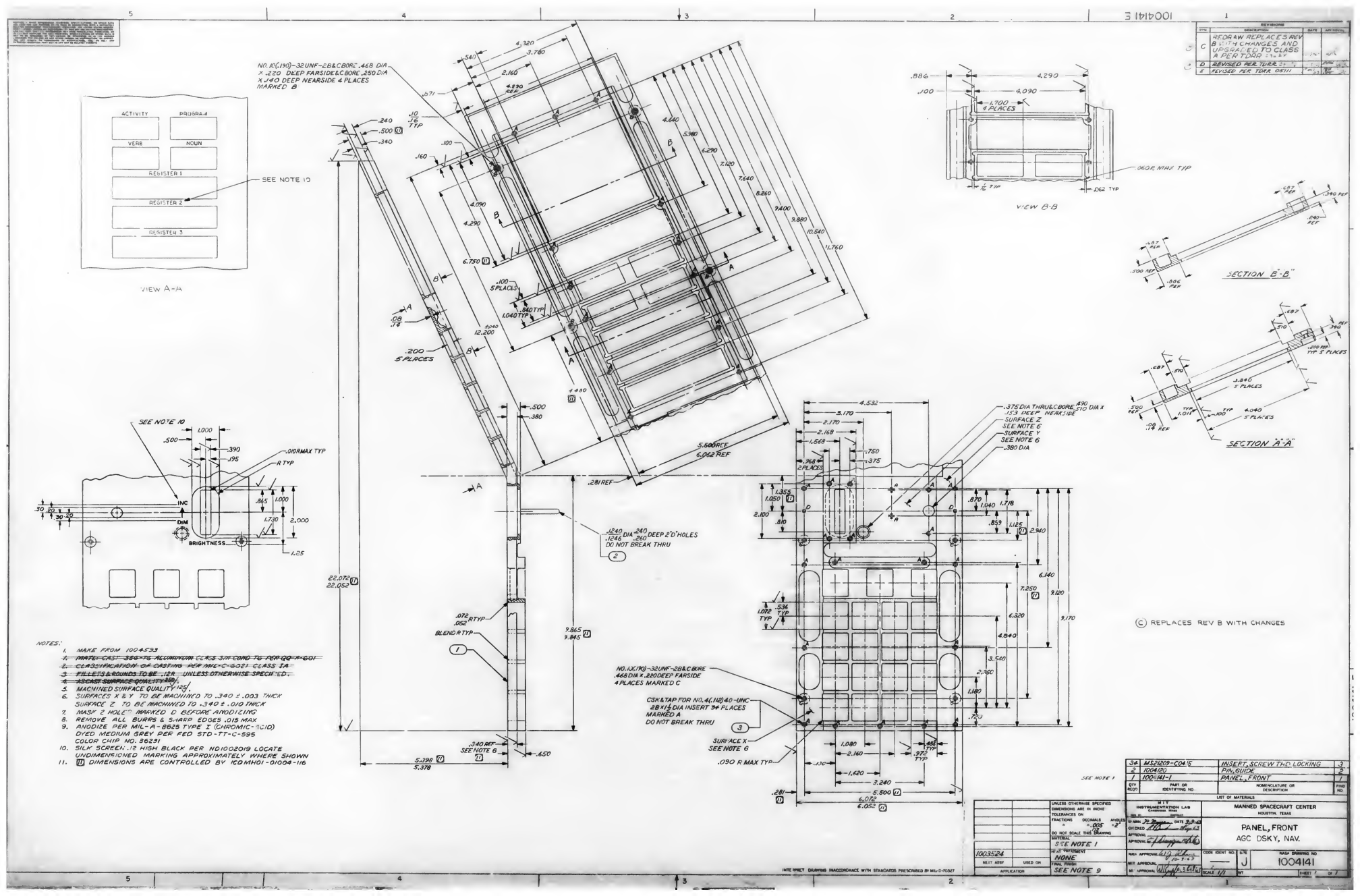
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HOUSING, KEYBOARD, NAVIGATION AGC KEYBOARD

CODE IDENT NO.	SIZE	NASA DRAWING NO
	D	1004139
SCALE 1/1	WT	SHEET 1 OF 1

1004139

INCHES

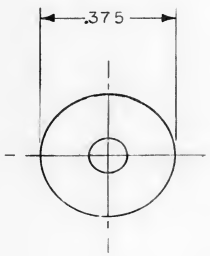

REVISIONS
C REDRAW REPLACES REV B WITH CHANGES AND UPGRADED TO CLASS A PER TDRR 2-247
D REVISED PER TDRR 3-1
E REVISED PER TDRR 05111
NO. 10(.190)-32UNF-2B&C BORE .468 DIA X .220 DEEP FARSIDE&C BORE .250 DIA X .140 DEEP NEARSIDE 4 PLACES MARKED B
ACTIVITY
PROGRAM
VERB
NOUN
REGISTER 1
REGISTER 2
REGISTER 3
SEE NOTE 10
VIEW A-A
4.320
3.780
2.160
4.890 REF
.540
.671
.240
.500
.340
.10 .16 TYP
.100
.160
4.090
4.290
6.750
.100 5 PLACES
.840 TYP
1.040 TYP
.08 .14
.200 5 PLACES
12.200
4.640
5.380
6.290
7.120
7.640
8.260
9.400
9.880
10.540
11.760
4.480
.500
.380
5.500 REF
6.062 REF
.281 REF
.1240 .1244 DIA .240 .260 DEEP 2 D HOLES DO NOT BREAK THRU
2
22.072
22.052
9.865
9.845
.072 .052 R TYP
BLEND R TYP
1
.340 REF SEE NOTE 6
.650
5.396
5.378
.886
.100
4.290
4.090
.700 4 PLACES
.060 R MIN TYP
.062 TYP
VIEW B-B
.687 REF
.340 REF
.240 REF
.687 REF
.700 REF
.906 REF
SECTION B-B
.687 REF
.510
.340 REF
.400 REF TYP 5 PLACES
.687 REF
.700 REF
.08 .14 REF
TYP 1.010
TYP .400
3.840 5 PLACES
4.040 5 PLACES
SECTION A-A
SEE NOTE 10
1.000
.500
.390
.195
.010 R MAX TYP
R TYP
.50
.20
.20
INC
DIM
BRIGHTNESS
.865
1.000
1.730
2.000
1.25
4.532
3.170
2.170
2.168
1.568
.968 2 PLACES
.750
.375
.375 DIA THRU & C BORE .490 DIA X .123 DEEP INCLUSIVE
SURFACE Z SEE NOTE 6
SURFACE Y SEE NOTE 6
.380 DIA
1.355
1.050
2.100
.810
.870
1.040
1.718
.859
1.125
2.940
6.140
7.250
9.120
9.170
1.072
.536 TYP
6.320
4.640
3.540
2.960
1.180
.720
NO. 13(.190)-32UNF-2B&C BORE .468 DIA X .220 DEEP FARSIDE 4 PLACES MARKED C
CSK & TAP FOR NO. 4(.112)40-UNC-2B 1/4 DIA INSERT 34 PLACES MARKED A DO NOT BREAK THRU
3
SURFACE X SEE NOTE 6
.090 R MAX TYP
.488 TYP
.972 TYP
1.080
2.160
.130
1.620
3.240
.281
5.500
6.072
6.052
SEE NOTE 1
NOTES:
1. MAKE FROM 1004593
2. MATL: CAST 356-T6 ALUMINUM CLASS 3 TYPE COND TO PER QQ-A-601
3. CLASSIFICATION OF CASTING PER MIL-C-6021 CLASS 14
4. FILLETS & ROUNDS TO BE .125 UNLESS OTHERWISE SPECIFIED.
5. AS CAST SURFACE QUALITY 250
6. MACHINED SURFACE QUALITY 125
7. SURFACES X & Y TO BE MACHINED TO .340 ± .003 THICK SURFACE Z TO BE MACHINED TO .340 ± .010 THICK
8. MASK 2 HOLES MARKED D BEFORE ANODIZING
9. REMOVE ALL BURRS & SHARP EDGES .015 MAX
10. ANODIZE PER MIL-A-8625 TYPE I (CHROMIC-ACID) DYED MEDIUM GREY PER FED STD-TT-C-595 COLOR CHIP NO. 36231
11. SILK SCREEN .12 HIGH BLACK PER ND1002019 LOCATE UNDIMENSIONED MARKING APPROXIMATELY WHERE SHOWN
12. (T) DIMENSIONS ARE CONTROLLED BY 1CDMH01-01004-116
© REPLACES REV B WITH CHANGES
3 MS21209-C0416 INSERT, SCREW THD LOCKING 3
2 1004120 PIN, GUIDE 2
1 1004141-1 PANEL, FRONT 1
QTY REQ'D PART OR IDENTIFYING NO. NOMENCLATURE OR DESCRIPTION FIND NO.
LIST OF MATERIALS
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHE TOLERANCES ON FRACTIONS DECIMALS .005 ANGLES ±2° DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINISH SEE NOTE 9
1003524
NEXT ASSY
USED ON
APPLICATION
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
MIT INSTRUMENTATION LAB Cambridge, Mass
DRAWN
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL
DATE 2-8-67
MANNED SPACECRAFT CENTER HOUSTON, TEXAS
PANEL, FRONT
AGC DSKY, NAV.
CODE IDENT NO. J
SIZE
NASA DRAWING NO 1004141
SCALE 1/1
WT
SHEET 1 OF 1

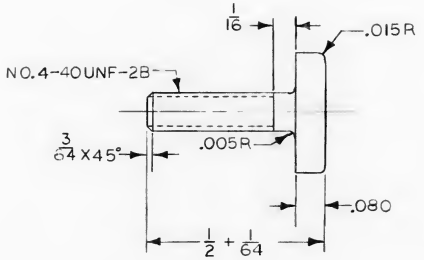
1004142

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01298 DATE 5-22-63





NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: 303CRES PER QQ-S-763B-1.
3. REMOVE BURRS & SHARP EDGES.
4. PASSIVATE PER MIL-F-14072.
5. 63 ALL OVER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J.F. Walsh DATE 5/3/63
CHECKED [illegible] 5-14-63
APPROVAL W.B. Turner 22 MAY 63
APPROVAL

NASA APPROVAL [signature] 5/22/63
MIT APPROVAL J. Walsh 5/22/63

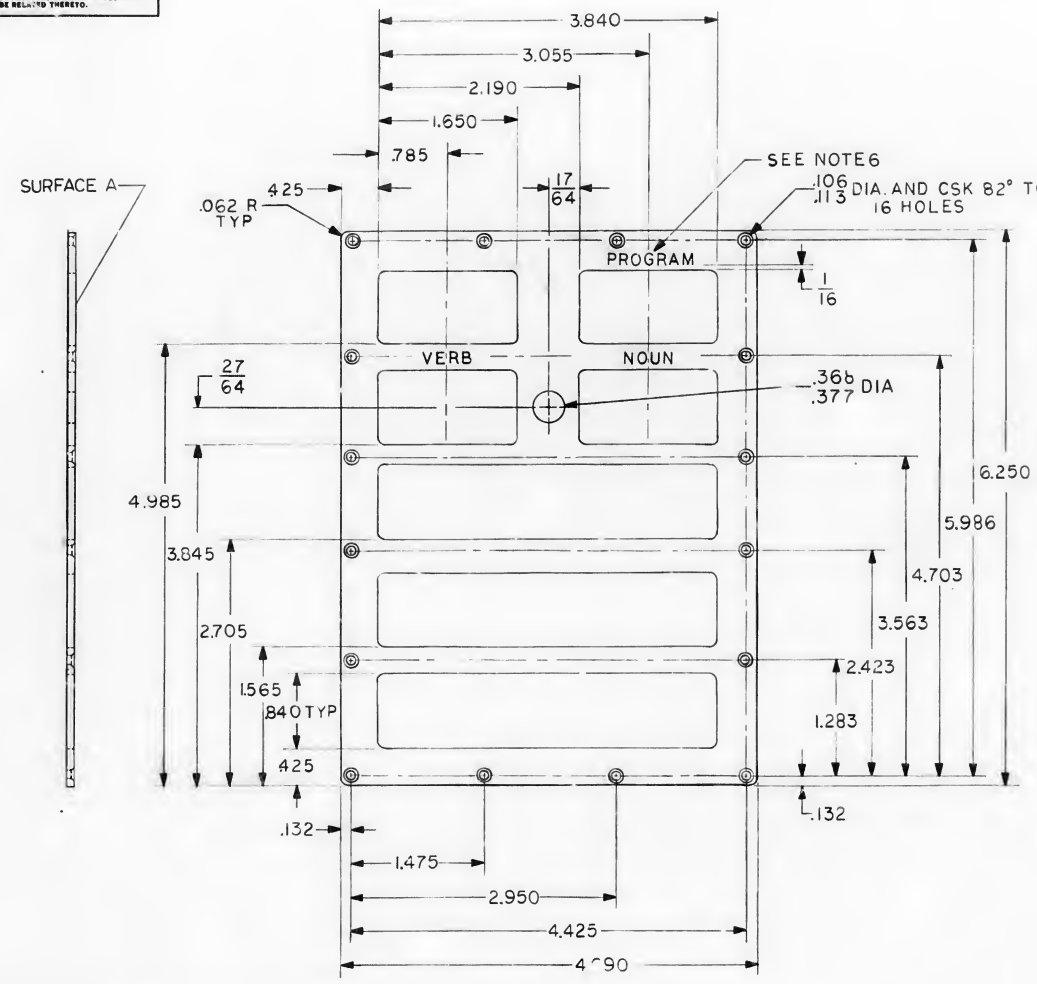
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

STOP, WEDGE
(AGC KEYBOARD)

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004142
SCALE	WT	SHEET OF

1004143

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01298 DATE 5-22-63

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327
2. MATERIAL: .090 THICK 6061-T6 AL PER QQ-A-327
3. REMOVE ALL BURRS AND SHARP EDGES
4. ANODIZE PER MIL-A-8625, TYPE II, DYED BLACK
5. PAINT SURFACE A MEDIUM GRAY PER FED. STD595-26231
6. SILK SCREEN 1/8 HIGH CHARACTERS BLACK PER ND 1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ±1/64 DECIMALS ±.005 ANGLES ±1/2°
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 2
HEAT TREATMENT —//—
FINAL FINISH —//—

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN E O'Connell DATE 5-3-63
CHECKED [signature] 5-14-63
APPROVAL W B Tanner 22 MAY 63
APPROVAL
NASA APPROVAL W. D. Dyer Jr. 5/22/63
MIT APPROVAL D Nagel 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COVER, READ-OUT
AGC KEYBOARD

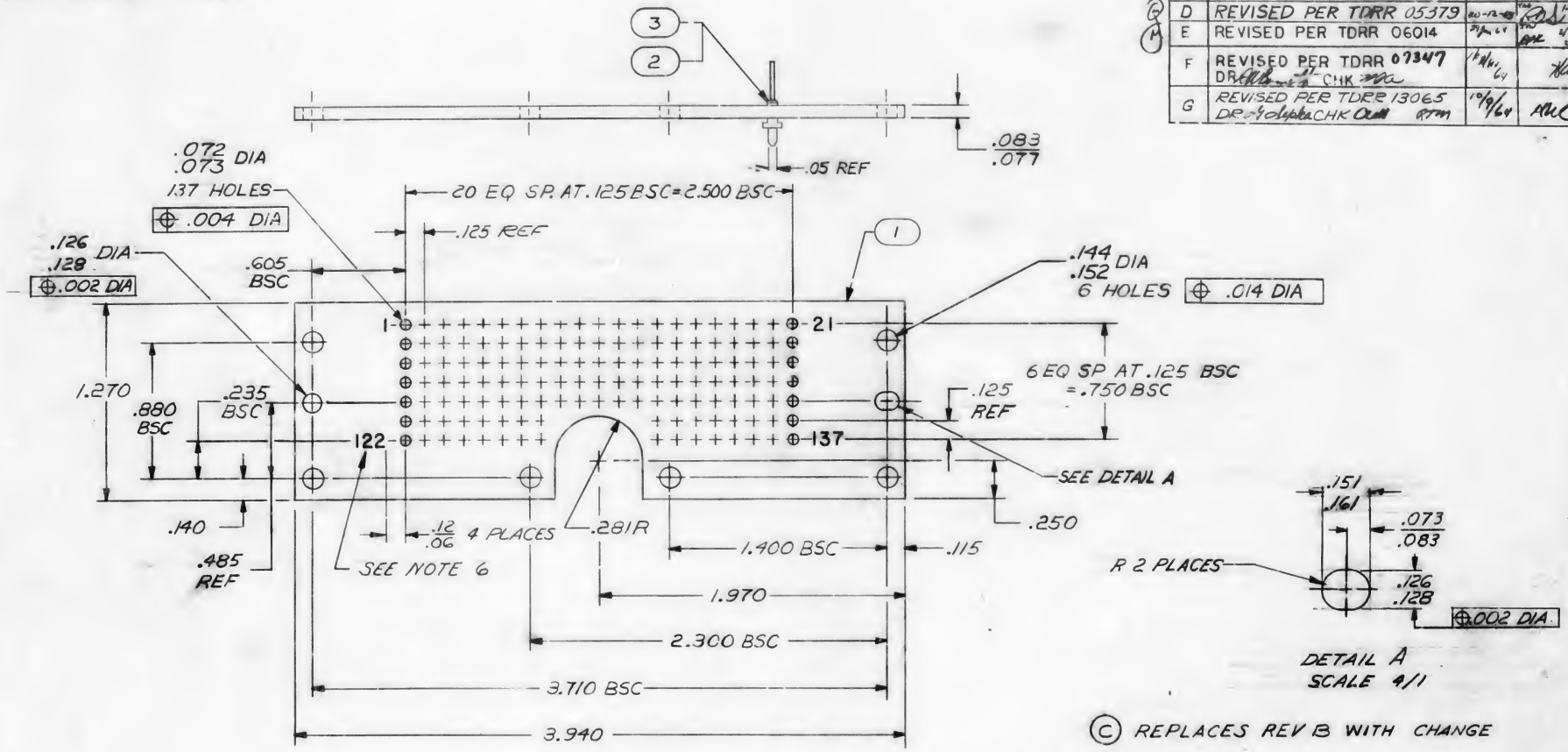
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004143

SCALE 1 : 1 WT SHEET 1 OF 1

1004143

1004145 G

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REDRAWN REPLACES REV B WITH CHANGE AND UPGRADED TO CLASS A PER TDRR 02900	9-4-63	DAT
D	REVISED PER TDRR 05379	20-12-63	
E	REVISED PER TDRR 06014	3/Jan 64	
F	REVISED PER TDRR 07347 DR CHK	1 Mar 64	
G	REVISED PER TDRR 13065 DR CHK	10/9/64	



DETAIL A
SCALE 4/1

(C) REPLACES REV B WITH CHANGE

NOTES
1. MATL: 6061-T6 ALUMINUM PER QQ-A-327 TEMP T6
2. REMOVE BURRS AND SHARP EDGES
3. ANODIZE PER MIL-A-8625 TYPE I DYED BLACK
4. 125/ ALL OVER
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. STENCIL .07/.09 HIGH WHITE PER ND1002019 AND ND1002122 TYPE II CLASS 1
7. IDENTIFY PER ND1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
137	1006782-3	CONTACT, WRAPOST-MALE	3
137	1006775	INSULATOR, WRAPOST-MALE	2
1	1004145-1	PLATE, RELAY TRAY	1

LIST OF MATERIALS

1003098	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE 3

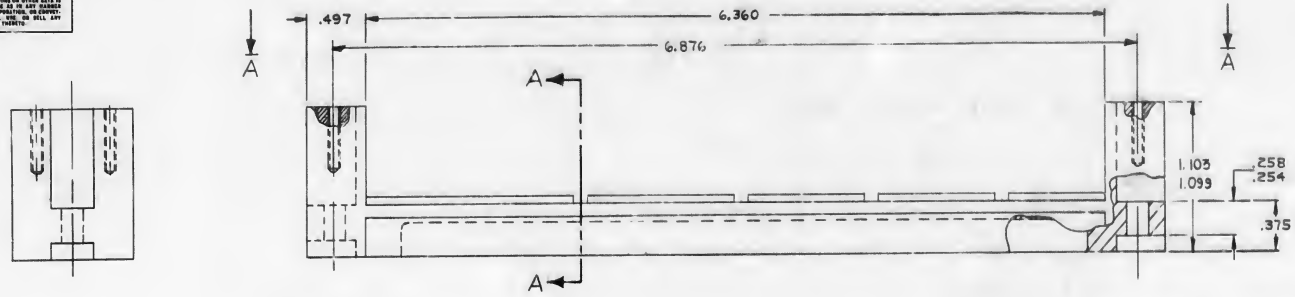
MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO. CONTRACT
DRAWN P.S. Tracy DATE 3 July 63
CHECKED R.F.S. 6 July 63
APPROVAL Norman Aug 20 63
APPROVAL Eldon C Hall 30 Aug
NASA APPROVAL [illegible] 9/5/63
MIT APPROVAL
MIT APPROVAL [illegible] 9/5/63

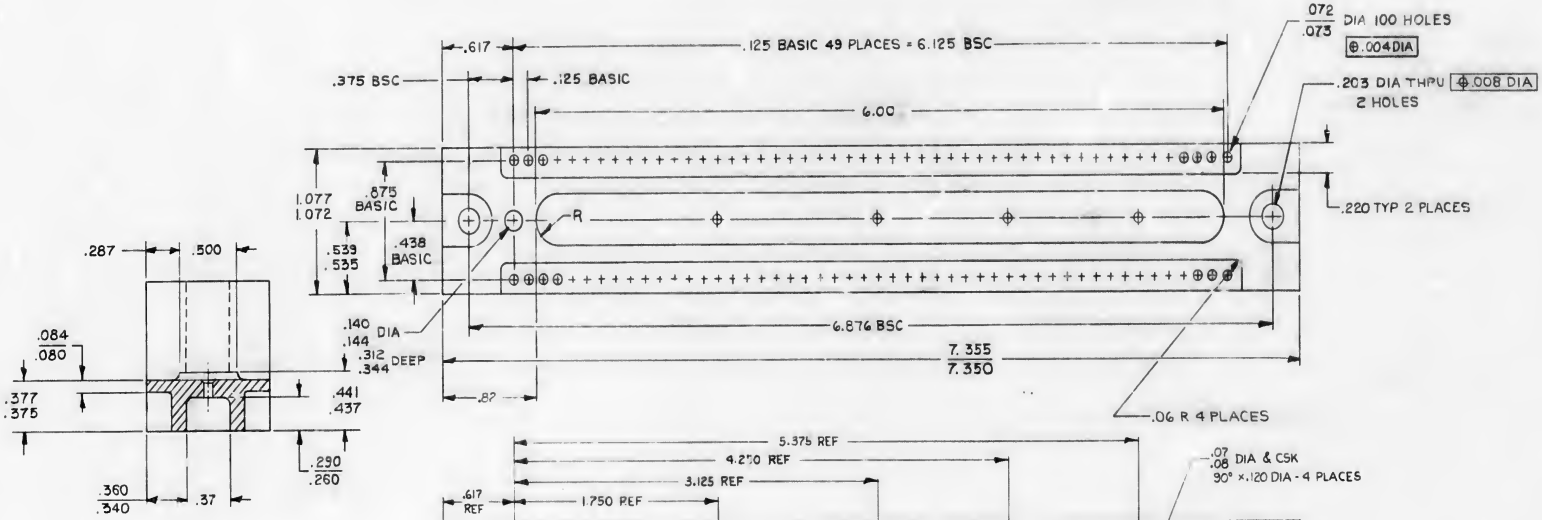
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE, RELAY MODULE
AGC KEYBOARD

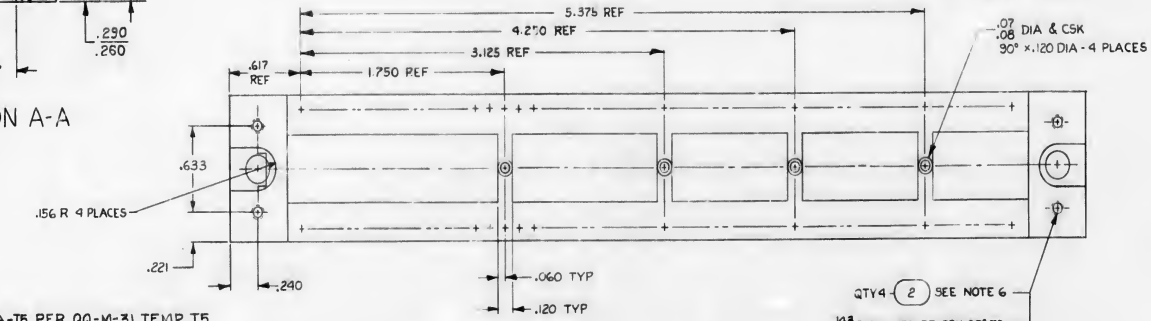
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1004145
SCALE 2/1	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN PER TDRR 07962 AND UPGRADED TO CLASS A		
C	REVISED, REDRAWN PER REVISIONS PER TDRR 08415	11-5-63	
D	REVISED PER TDRR 05181	2 DEC 63	
E	REVISED PER TDRR 07300 DR FH CHK	4/1/64	
F	REVISED PER TDRR 09796 DR CHK	5/28/64	
G	REVISED PER TDRR 10383 DR CHK	6/23/64	
H	REVISED PER TDRR 10947 DR CHK	8/5/64	





SECTION A-A



VIEW A-A

(B) REPLACES REV A WITH CHANGE.
(C) ORIGINAL MASTER WAS LOST. THIS IS A RE-DRAW TO REPLACE THE LOST DOCUMENT.

NOTES

1. MATL: MAG ZK60A-T5 PER QQ-M-31 TEMP T5
2. MACHINED SURFACE QUALITY 125/ UNLESS OTHERWISE SPECIFIED
3. ~~ANODIZE PER MIL-M-8171, TYPE II / NO PROCESS ENTIRE SURFACE PER ND1002040~~
4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
5. BREAK SHARP EDGES
6. INSTALL FIND NO. 2 PER ND1002121
7. UNLESS OTHERWISE SPECIFIED ALL FILLETS AND RADII TO BE .005/.015
8. FINISH: ANODIZE PER MIL-M-45202, TYPE I, CLASS C
9. IDENTIFY PER ND1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
4	1000115-1	INSERT, THREADED SELF LOCKING	2
1	1004146-1	HEADER AGC KEYBOARD	1

LIST OF MATERIALS

1003536	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS XXX ±.005 XX .02 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 1
HEAT TREATMENT: NONE
FINAL FINISH: SEE NOTE 3

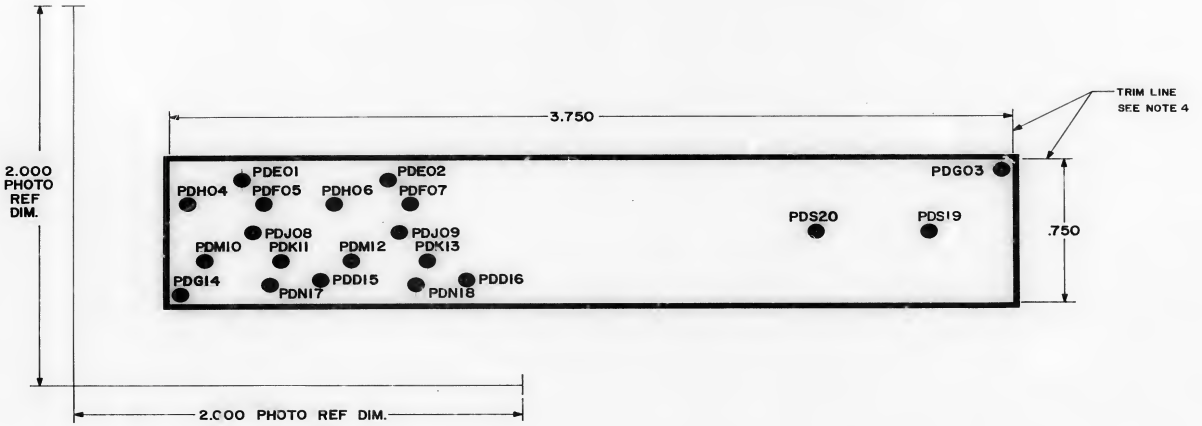
MIT INSTRUMENTATION LAB Camb.
DRAWN [signature] DATE 4 Nov 63
CHECKED [signature] 4 Nov 63
APPROVAL [signature] 5 NOV 63
APPROVAL [signature]
NASA APPROVAL [signature]
MIT APPROVAL [signature] 5 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HEADER
DECODING MODULE
AGC DSKY NAV & MAIN

CODE IDEN. NO. —
SIZE D
NASA DRAWING NO. 1004146
SCALE 2/1
WT
SHEET 1 OF 1

REVISIONS 03857			
SYM	DESCRIPTION	DATE	APPROVAL
A	REDRAWN WITH CHANGE PER TDRR 04771	1-1-70	



Ⓐ REPLACED WITH CHANGE BY REV B

INACTIVE

NOTES:
1. MATERIAL: .006/.008 THICK PLASTIC SHEET, SENSITIZED, DIMENSIONALLY STABLE PER L-P-340, TYPE IB, CLASS 2, STYLE IA
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS SHALL NOT EXCEED .001 INCH PER FOOT.
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER NEGATIVE AND POSITIVE FILMS TO DIMENSIONS SHOWN
6. ● .078/.082 DIA PUNCH ALL HOLES

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
.XX ±.020 °
.XXX ±.005 °
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT
FINISH

NEXT ASSY 003824 | USED ON
APPLICATION

M.I.T. INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO. 1004147

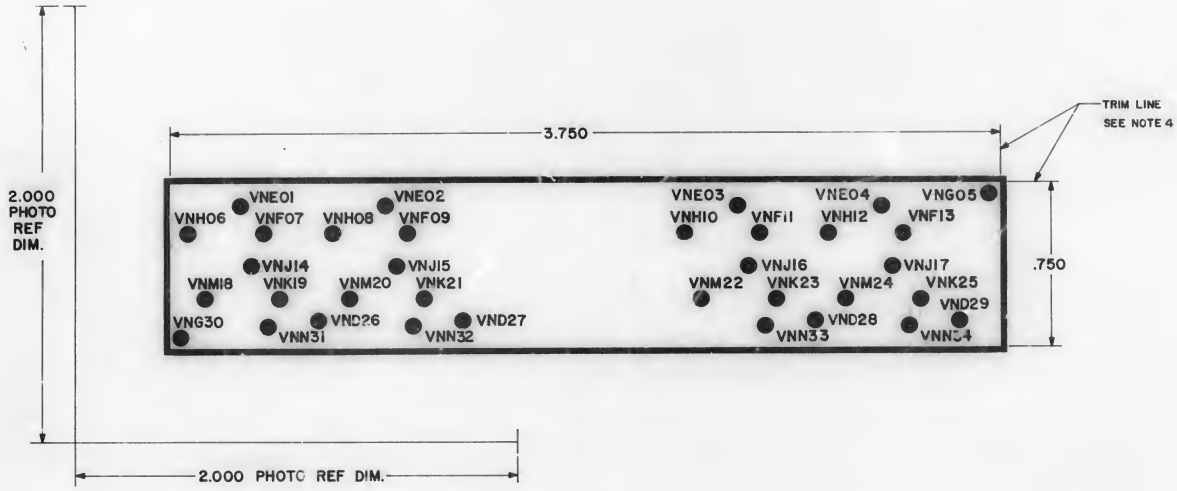
DRAWN R.S. Berg DATE 4-30-68
CHECKED R.S. Berg 5-29-68
APPROVAL D.G. Hamilton 5-29-68
APPROVAL C.C. Hall 5-29-68
NASA APPROVAL [illegible] 7/1/70
MIT APPROVAL [illegible] 7/21/70

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PHOTOGRAPHIC MASTER PROGRAM DISPLAY AGC KEYBOARD

CODE IDENT NO. —— | SIZE E | NASA DRAWING NO 1004147
SCALE 5/1 | WT | SHEET 1 OF 1

REVISIONS 03782			
SYM	DESCRIPTION	DATE	APPROVED
A	REPLACED WITH CHANGE PER TDRR 04771	7-14-65	



NOTES:

1. MATERIAL : .006/.008 THICK PLASTIC SHEET, SENSITIZED, DIMENSIONALLY STABLE PER L-P-340, TYPE I B, CLASS 2, STYLE I A.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL ENSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS NOT TO EXCEED .001 INCH PER FOOT
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER, NEGATIVE AND POSITIVE FILMS, TO DIMENSIONS SHOWN
6. ● .078/.082 DIA. PUNCH ALL HOLES

Ⓐ REPLACED WITH CHANGE BY REV B

INACTIVE

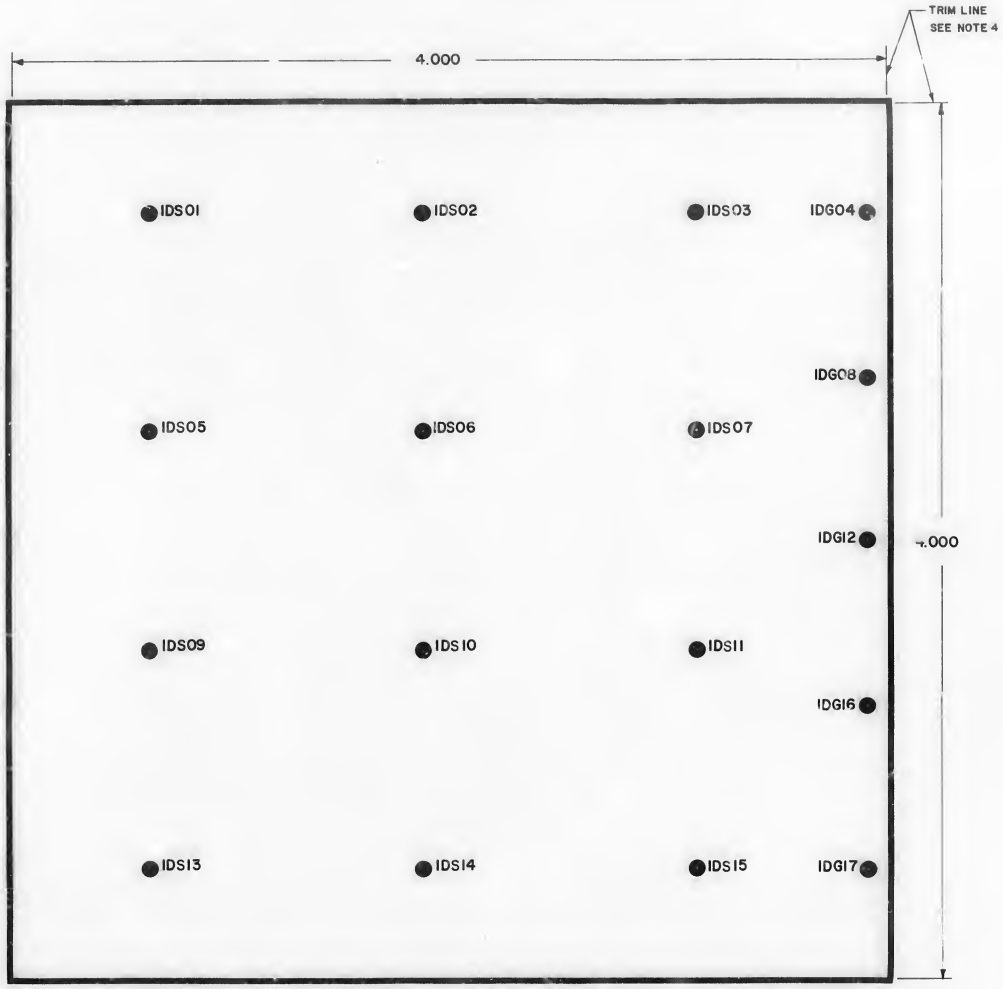
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .010 .030 ° DO NOT SCALE THIS DRAWING	M I T INSTRUMENTATION LAB Cambridge, Mass. DRAWN [illegible] DATE 5-4-65 CHECKED [illegible] APPROVED [illegible] APPROVAL [illegible]
		MATERIAL SEE NOTE 1	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
		HEAT TREATMENT	PHOTOGRAPHIC MASTER VERB-NOUN DISPLAY ASC KEYBOARD
1003524		FINAL FINISH	NASA APPROVAL [illegible]
NEXT ASSY	USED ON	APPLICATION	MIT APPROVAL [illegible] 7-14-65

CODE IDENT NO	SIZE	NASA DRAWING NO
—	E	1004148
SCALE 5/1	WT	SHEET 1 OF 1

1004148 A

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVAL	
A	REPLACED WITH CHANGE PER TDRR 04791	1963	[illegible]	



NOTES:
1. MATERIAL: .006/.008 THICK PLASTIC SHEET, SENSITIZED, DIMENSIONALLY STABLE PER L-F-340, TYPE IB, CLASS 2, STYLE IA
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. ORIGINAL OF THIS DRAWING OR REPRODUCTION MADE BY A PROCESS OR METHOD SHALL INSURE DIMENSIONAL STABILITY. DIMENSIONAL VARIATIONS SHALL NOT EXCEED .001 INCH PER FOOT.
4. CUT TO WITHIN .010 OF TRIM LINE
5. MAKE PHOTOGRAPHIC MASTER NEGATIVE AND POSITIVE FILMS TO DIMENSIONS SHOWN
6. ● .078/.082 DIA PUNCH ALL HOLES

Ⓐ REPLACED WITH CHANGE BY REV B

INACTIVE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS .020 ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT
FINAL FINISH

1003524 NEXT ASSY USED ON APPLICATION

M I T INSTRUMENTATION LAB Cambridge Mass
DRWG APPROVED
DRAWN [illegible] DATE 2Dec68
CHECKED [illegible] 27Dec68
APPROVED [illegible]
APPROVAL [illegible] 27 Dec 68
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

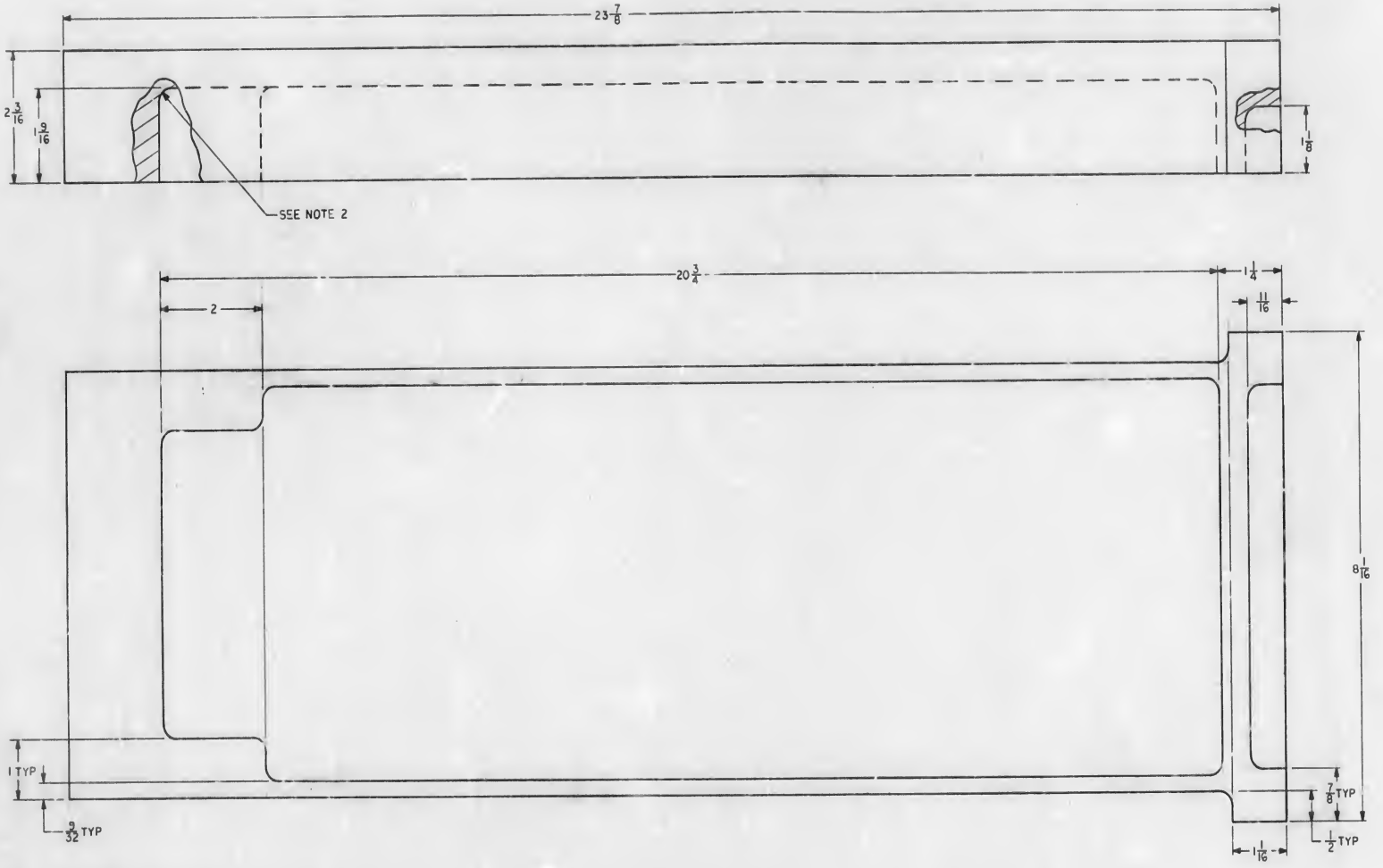
PHOTOGRAPHIC MASTER INDICATOR DISPLAY AGC KEYBOARD

CODE IDENT NO E
SIZE E
NASA DRAWING NO 1004149
SCALE 8/1 WT
SHEET 1 OF 1

1004149 A

INCHES

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. ALL FILLETS AND RADII 1/4 R
3. MATL: ASTM NO. ZK60A-T5 MAG ALLOY / QQ-M-31A

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS 1/64 DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 3
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO. | CONTRACT
DRAWN [illegible] DATE 7-12-63
CHECKED R. King 7/12/63
APPROVAL W. Hoffman 7/12/63
APPROVAL [illegible] 7/12/63
NASA APPROVAL W. S. Robbins 07-3463
MIT APPROVAL L. Hall 7/12/63

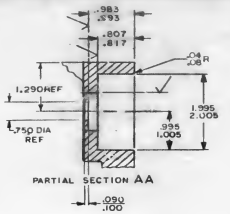
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

ROUGH MACHINING COMPUTER TRAY

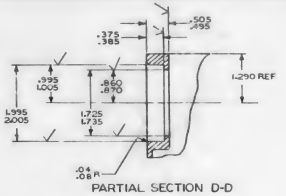
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	D	1004150
SCALE 1/1	WT	SHEET 1 OF 1

1004150 D

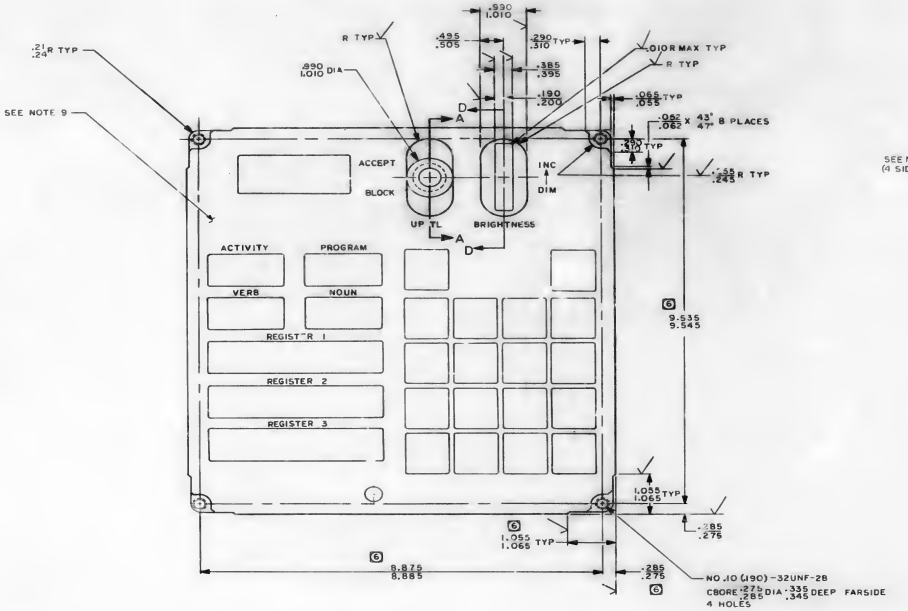
REVISIONS per TDRR 08735			
LTR	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 05113 DR [illegible] CHK [illegible]	[illegible]	[illegible]
B	REVISED PER TDRR 05790	7/11/69	[illegible]
C	REVISED PER TDRR 07367 DR [illegible] CHK [illegible]	3/70	[illegible]
D	REVISED PER TDRR 07644 DR [illegible] CHK [illegible]	4/70	[illegible]
E	REVISED PER TDRR 10492 DR 10 [illegible] CHK [illegible]	7/70	[illegible]
F	REVISED PER TDRR 10598 DR 30 [illegible] CHK [illegible]	8/70	[illegible]

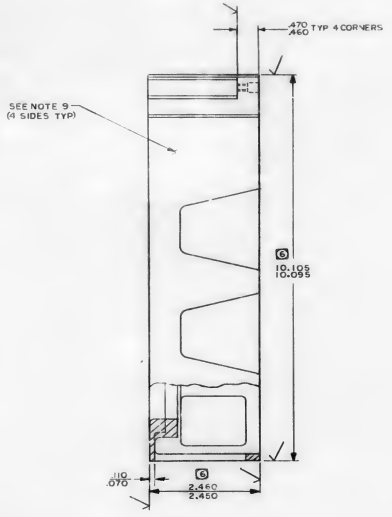


PARTIAL SECTION AA



PARTIAL SECTION D-D





NOTES
1. MAKE FROM DWG 1004586
2. SURFACE MARKED √ TO BE √ 125
3. REMOVE ALL BURRS AND SHARP EDGES
4. ANODIZE PER MIL-A-8625, TYPE I CHROMIC-ACID DYED BLACK
5. SILK SCREEN .12 HIGH WHITE PER ND1002019 LOCATE MARKING APPROXIMATELY WHERE SHOWN
6. (6) DIMENSIONS ARE CONTROLLED BY ICDMH01-01005-116
7. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
8. (G) NOTES CONTROLLED BY ICD-MH01-01046-416
9. PAINT INDICATED SURFACES WITH 1010729-1 MEDIUM GREY EPOXY RESIN ENAMEL PER ND1002110
10. IDENTIFY P/N ND1002019

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	INSTRUMENTATION LAB CAMBRIDGE, MASS.
		DO NOT SCALE THIS DRAWING	MATERIAL SEE NOTE 1
1003459			HEAT TREATMENT NONE
NEXT ASSY	USED ON		FINISH SEE NOTE 4
APPLICATION			

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN [illegible] DATE 6/27/68
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

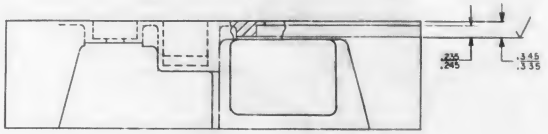
HOUSING, FRONT PANEL
AGC DSKY MAIN

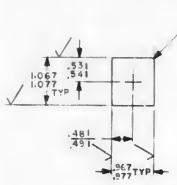
CODE IDENT NO. — SIZE E — NASA DRAWING NO 1004151
SCALE 1/1 WT — SHEET 1 OF 2

MASTER

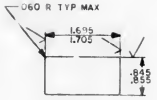
1004151F

REVISIONS			
QTY	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 05113		
B	REVISED PER TDRR 05790 DR [illegible] CHK [illegible]	1/66	
C	REVISED PER TDRR 07267 DR [illegible] CHK [illegible]	5/66	
D	REVISED PER TDRR 07644 DR [illegible] CHK [illegible]	8/66	
E	REVISED PER TDRR 10892 DR N. Sumner CHK [illegible]	1/67	
F	REVISED PER TDRR 12038 DR [illegible] CHK [illegible]	6/67	

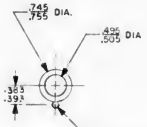




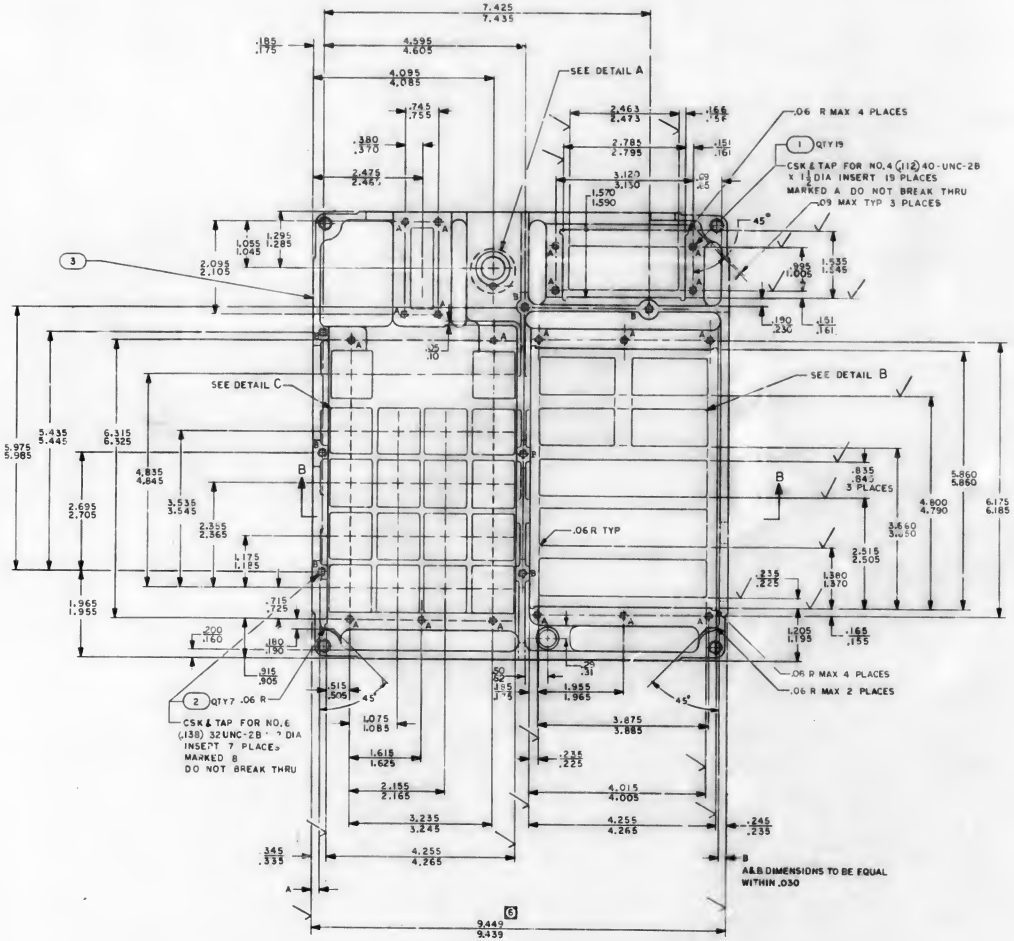
DETAIL C
18 PLACES

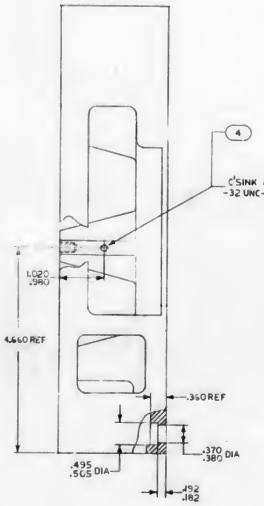


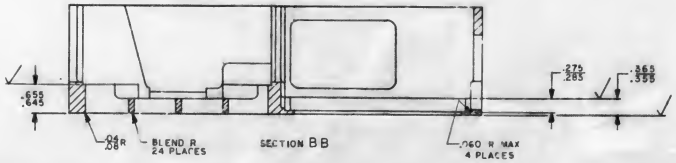
DETAIL B
4 PLACES



DETAIL A







QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
1	MS21209-C0815	INSERT, HELICAL	4
SEE NOTE 1	1004151-1	HOUSING, FRONT PANEL	3
7	MS21209-C0620	INSERT, HELICAL	2
19	MS21209-C0415	INSERT, HELICAL	1

LIST OF MATERIAL:

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL	MIT INSTRUMENTATION LAB Cambridge Mass. DRAWN H. Carlson DATE 4/26/65 CHECKED [illegible] APPROVAL [illegible] APPROVAL [illegible]
1003459		HEAT TREATMENT	NASA APPROVAL [illegible]
1003540		FINAL FINISH	MIT APPROVAL [illegible]
NEXT ASSY	USED ON		MIT APPROVAL [illegible]
	APPLICATION		

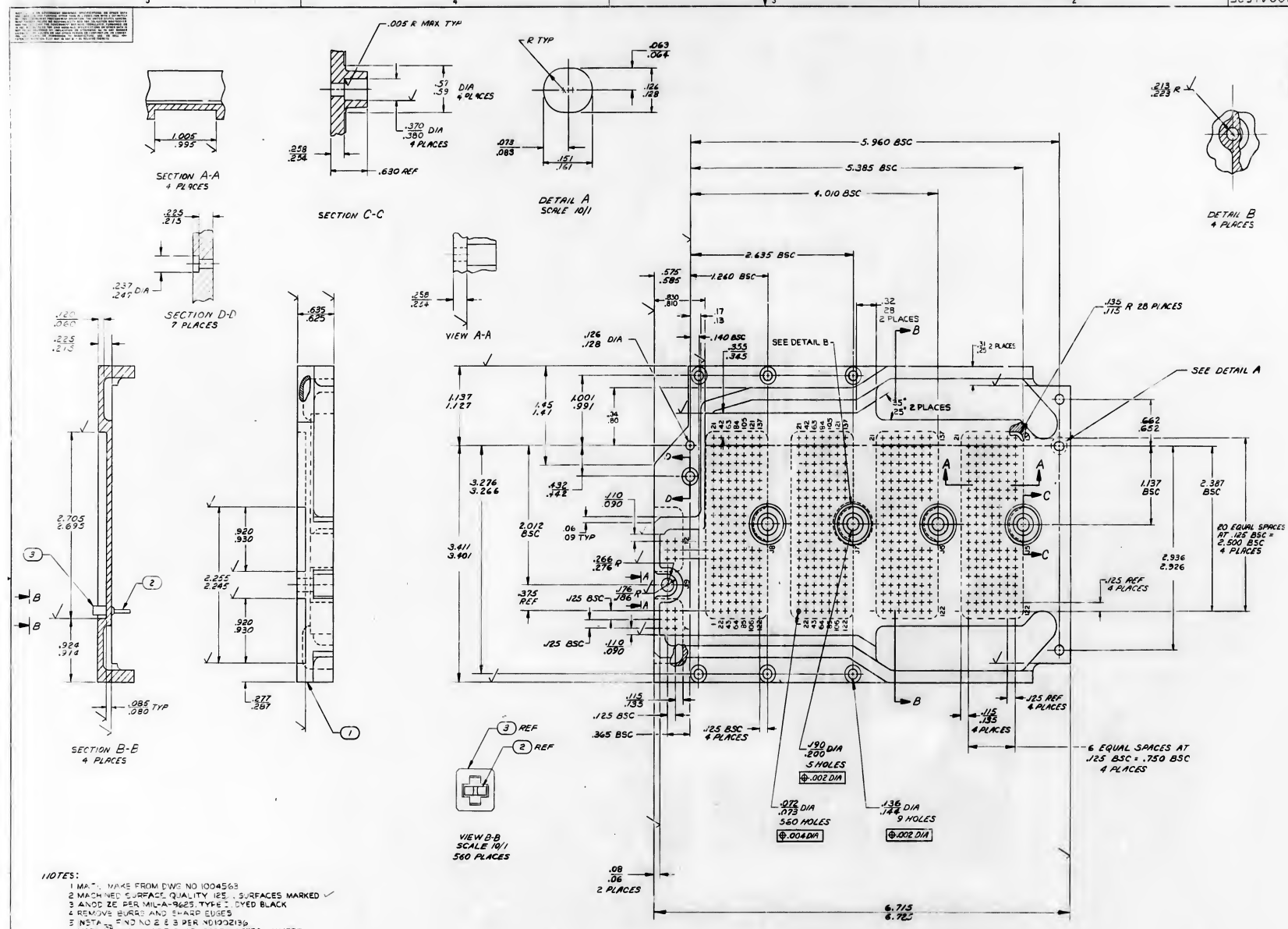
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HOUSING, FRONT PANEL
AGC DSKY MAIN

CODE IDENT NO —— SIZE E NASA DRAWING NO 1004151

SCALE 1/1 WT SHEET 2 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REDRAW REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A PER TDRR 03624		
C	REVISED PER TDRR 04614		
D	REVISED PER TDRR 04772		
E	REVISED PER TDRR 05766		
F	REVISED PER TDRR 07341 DR [illegible] CHK [illegible]		



NOTES:
1. MATL: MAKE FROM DWG NO 1004563
2. MACHINED SURFACE QUALITY 125, SURFACES MARKED ✓
3. ANODIZE PER MIL-A-8625, TYPE I, DYED BLACK
4. REMOVE BURRS AND SHARP EDGES
5. INSTALL P/N NO 2 & 3 PER ND1002136
6. MARK P/N HIGH WHITE CHARACTERS APPROX WHERE SHOWN PER ND 1002019

(B) REPLACES REVISION A

SEE NOTE 1

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	TYP
560	1006774	INSULATOR, WRAPOST, FEMALE	3
560	1006781-4	CONTACT, MALCO	2
1	1004152-1	PLATE, CONNECTOR	1

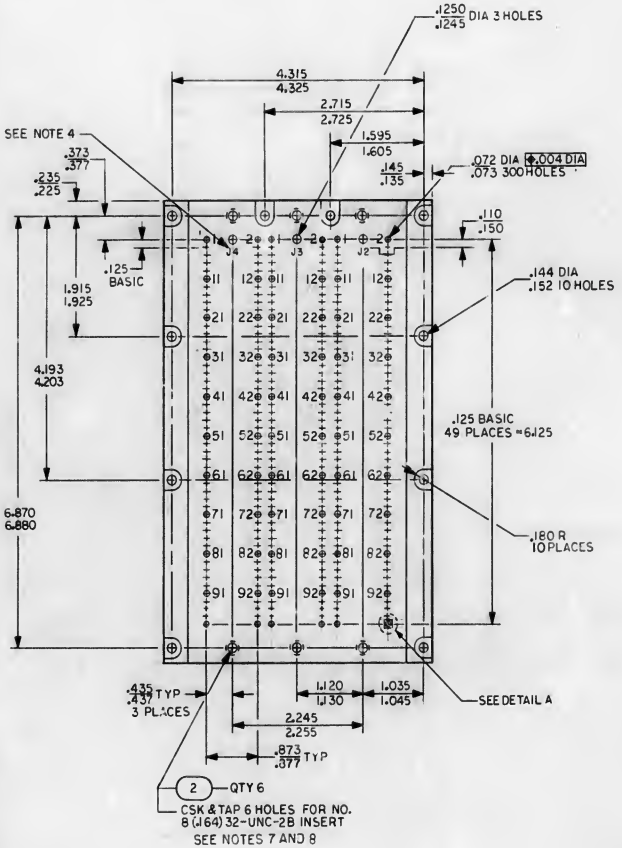
LIST OF MATERIALS

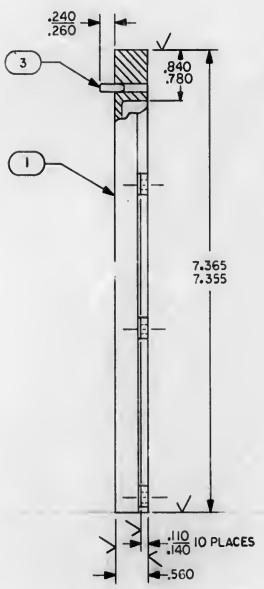
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING	MIT INSTRUMENTATION LAB Cambridge, Mass. CONTRACT	MANNED SPACECRAFT CENTER HOUSTON TEXAS	
MATERIAL SEE NOTE 1	DRAWN [illegible] DATE 8/16/68	PLATE, CONNECTOR RELAY HOUSING ASSY AGC DSKY, NAV	
HEAT TREATMENT NONE	CHECKED [illegible]		
FINISH SEE NOTE 4	APPROVAL		
1003535 NEXT ASSY	APPROVAL [illegible]		
USED ON APPLICATION	NASA APPROVAL [illegible] DATE 10-7-68	CODE IDENT NO —	SIZE J
	MIT APPROVAL		NASA DRAWING NO 1004152
	MIT APPROVAL [illegible] DATE 8/16/68	SCALE 2/1 WT	SHEET 1 OF 1

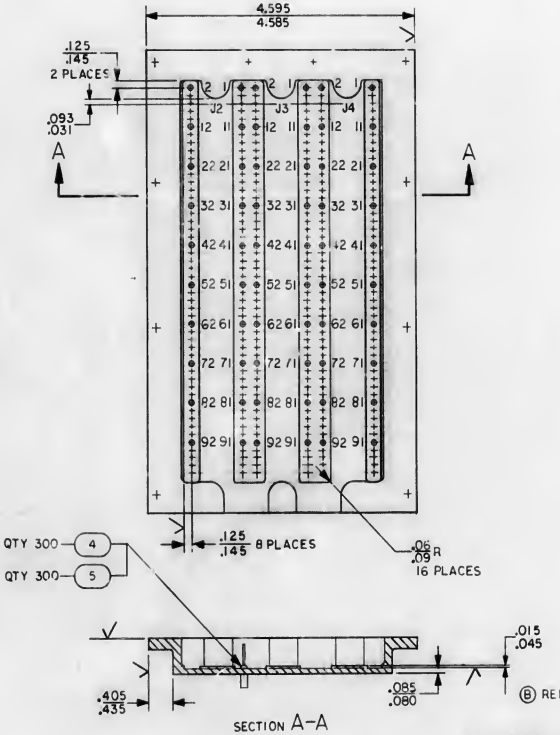
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

C1004154

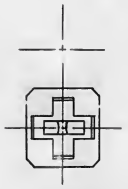
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REDRAWN REPLACES REV A WITH CHANGES & UPGRADE TO CL A PER TDRR 03624	10-3-63	
C	REVISED PER TDRR 04176	10-17-63	







Ⓑ REPLACES REV A WITH CHANGES



DETAIL A
SCALE 10/1

NOTES:—
1. MAKE FROM DWG NO. 1004566
2. SURFACE MARKED √ TO BE 125
3. ANODIZE PER MIL-A-8625, TYPE I, DYED BLACK
4. MARK .06 HIGH WHITE PER NDI002019 BOTH SIDES
5. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
6. INSTALL FIND NO. 4 AND FIND NO. 5 PER ND 1002136
7. INSTALL FIND NO. 2 PER MS 33646 BREAK OFF DRIVING TANG
8. COAT FIND NO. 2 WITH MIL-P-8585 WET ZINC CHROMATE PRIMER

SEE NOTE 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
300	1006781-2	CONTACT, WRAPOST, FEMALE	5
300	1006774	INSULATOR, WRAPOST, FEMALE	4
3	1004248	PIN, KEYING	3
6	MS21209-C0815	INSERT, HELICAL	2
1	1004154-1	PLATE, WIREWRAP	1

LIST OF MATERIALS

1003531	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.005 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT NONE
FINAL FINISH SEE NOTE 3

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN P.S. Tripp DATE 8/23/63
CHECKED G.K. Bergin 8/23/63
APPROVAL [signature] 10/3/63
APPROVAL [signature] 10/3/63
NASA APPROVAL [signature] 10-3-63
MIT APPROVAL [signature] 10/3/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

PLATE CONNECTOR DECODING MODULE
AGC DSKY, NAV

CODE IDENT NO. —— SIZE D NASA DRAWING NO. 1004154
SCALE 1/1 WT SHEET 1 OF 1

1004154 C

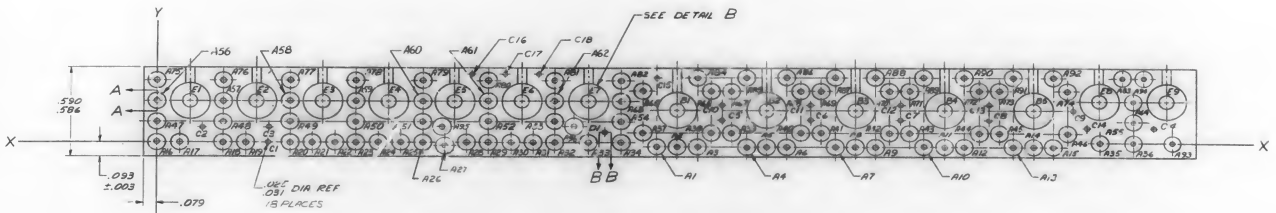
SYM	REVISIONS: DESCRIPTION	DATE	APPROVED
B	REDRAWN REPLACES REV A WITH CHANGES AND MADE CHANGE A PER TDN 5413		
C	REVISED PER TDN 5432		
D	REVISED PER TDN 6351		

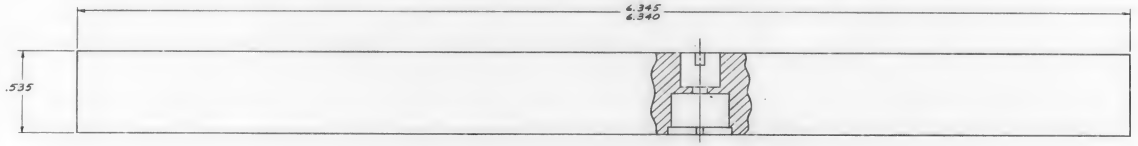
HOLE IDENT	BASIC X DIM	BASIC Y DIM	HOLE DIA	⊕ DIA
A1	3.016	-0.026	SEE SECTION A-A	.006
A2	3.137			
A3	3.258			
A4	3.553			
A5	3.674			
A6	3.795			
A7	4.090			
A8	4.211			
A9	4.332			
A10	4.627			
A11	4.748			
A12	4.869			
A13	5.164			
A14	5.285			
A15	5.406	-0.026		
A16	0.000	0.000		
A17	0.134			
A18	0.400			
A19	0.534			
A20	0.800			
A21	0.934			
A22	1.068			
A23	1.200			
A24	1.334			
A25	1.468			
A26	1.600	0.000		
A27	1.734	-0.015		
A28	1.868	0.000		
A29	2.000			
A30	2.134			
A31	2.268			
A32	2.400			
A33	2.600			
A34	2.800			
A35	5.685			
A36	5.885	0.000		
A37	2.929	0.061		
A38	3.345			
A39	3.466			
A40	3.582			
A41	4.003			
A42	4.419			
A43	4.540			
A44	4.956			
A45	5.077			
A46	5.493	0.061		
A47	0.000	0.137		
A48	0.400			
A49	0.800			
A50	1.200			
A51	1.600			
A52	2.000			
A53	2.400			
A54	2.800			
A55	5.885	0.137		
A56	0.000	0.274		
A57	0.400			
A58	0.800			
A59	1.200			
A60	1.600			
A61	2.000			
A62	2.400			
A63	2.800			
A64	5.885	0.274		
A65	2.929	0.342		
A66	3.345			
A67	3.466			
A68	3.882			
A69	4.003			
A70	4.419			
A71	4.540			
A72	4.956			
A73	5.077			
A74	5.493	0.342		
A75	0.000	0.411		
A76	0.400			
A77	0.800			
A78	1.200		SEE SECTION A-A	.006
A79	1.600			
A80	2.000	0.411		

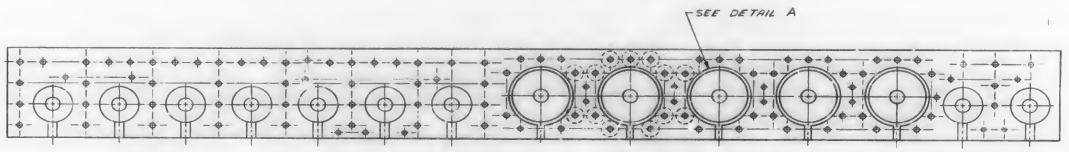
HOLE IDENT	BASIC X DIM	BASIC Y DIM	HOLE DIA	⊕ DIA
A81	2.400	0.411	SEE SECTION A-A	.006
A82	2.800	0.411		
A83	5.820	0.425		
A84	3.254			
A85	3.557			
A86	3.791			
A87	4.094			
A88	4.328			
A89	4.631			
A90	4.865			
A91	5.168		SEE SECTION A-A	.006
A92	5.402	0.425		
A93	6.130	0.000		
A94	5.950	0.425		
A95	1.716	0.105		
A96	2.516	0.105		
B1	3.137	0.216		.006
B2	3.674		SEE DETAIL A	
B3	4.211			.006
B4	4.748			
B5	5.285	0.216		

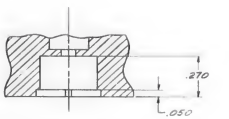
HOLE IDENT	BASIC X DIM	BASIC Y DIM	HOLE DIA	⊕ DIA
C1	0.675	0.000	.025 .031	.006
C2	0.275	0.100		
C3	0.675	0.100		
C4	6.010	0.100		
C5	3.406	0.151		
C6	3.943	0.151		
C7	4.480	0.151		
C8	5.017	0.151		
C9	5.522	0.216		
C10	3.406	0.251		
C11	3.943	0.251		
C12	4.480	0.251		
C13	5.017	0.251		
C14	5.610	0.100		
C15	3.016	0.429		
C16	1.900	0.455		
C17	2.100	0.455	.025 .031	.006
C18	2.300	0.455		
D1	2.700	0.061	SEE SECTION B-B	.006

HOLE IDENT	BASIC X DIM	BASIC Y DIM	HOLE DIA	⊕ DIA
E1	0.200	0.274	SEE DETAIL B	.006
E2	0.600			
E3	1.000			
E4	1.400			
E5	1.800			
E6	2.200			
E7	2.600			
E8	5.685		SEE DETAIL B	.006
E9	6.085	0.274		

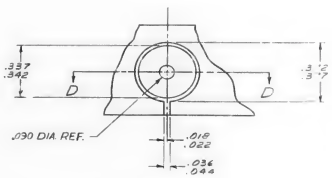




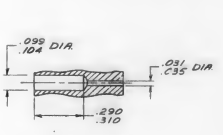




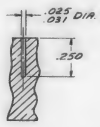
SECTION D-L



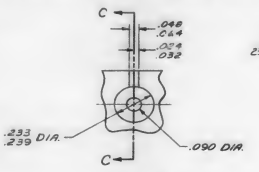
DETAIL A
5 PLACES



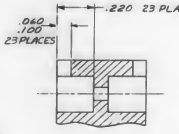
SECTION A-A
96 PLACES



SECTION B-B



DETAIL B
23 PLACES



SECTION C-C
9 PLACES

Ⓑ REPLACES REV A WITH CHANGE

NOTES:
1. MATERIAL: PLASTIC, CLEAR ACRYLIC PER MIL-P-8184, FINISH B, A.T. INL-P-5425 FINISH B
2. REMOVE BURRS & SHARP EDGES

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION
		LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIM. ASSYS. ARE IN INCHES
TOLERANCES ON: FRACTIONS ± DECIMALS ± ANGLES ±.005
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE 1
HEAT TREATMENT: NONE
FINISH: NONE

NEXT ASSY	USED ON
APPLICATION	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN	RAG	DATE 8/4/65
CHECKED	[illegible]	DATE 8/4/65
APPROVAL	[illegible]	
APPROVAL	[illegible]	
NASA APPROVAL	[illegible]	
M.I.T. APPROVAL	[illegible]	

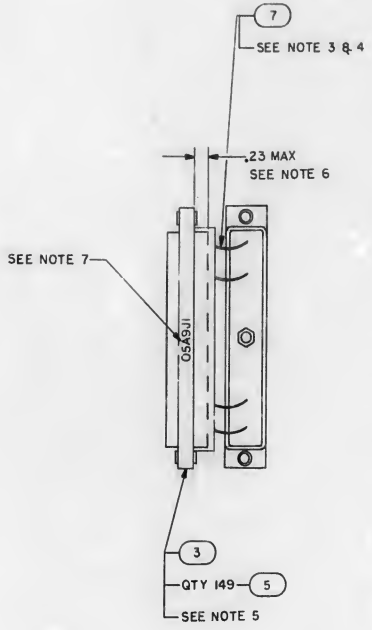
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

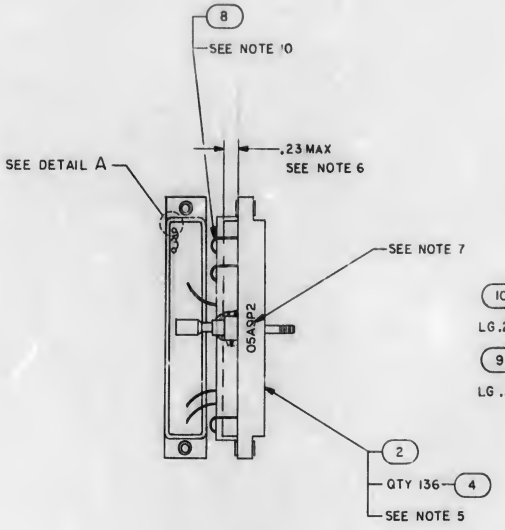
BLOCK, COMPONENT
DECODING MODULE
AGC DSKY, NAV & MAIN

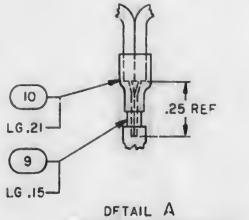
CODE IDENT NO	SIZE	NAS: DRAWING NO
—	J	1004155
SCALE 4/1	WT	SHEET 1 OF 1

1004155 D

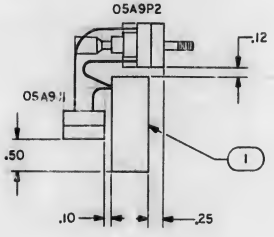
REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
B		REPLACES REV A WITH CHANGE PER TDRR 21345			7/9/65	
C		REVISED PER TDRR 21580			7/19/65	
D		REVISED PER TDRR 22461			9/24/65	







DETAIL A
TYP FOR DUAL CONNECTIONS
SCALE NONE



Ⓑ REPLACES REV A WITH CHANGE

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. FOR FABRICATION SEE NDI002032
3. FOR WIRING OF 05A9J1, 05A9P2 AND MODULE SEE WIRING DIAGRAM NO. 1006184
4. STRIP ALL WIRES .19 DO NOT TIN
5. INSTALL CRIMP STYLE TERMINALS IN ACCORDANCE WITH NDI002206
6. ENCAPSULATE INDICATED AREA PER NDI002009 METHOD E. MOUNTING SURFACES OF CONNECTORS MUST NOT BE ENCAPSULATED
7. MARK .200/.180 HIGH PER NDI002019 AND 1002122 TYPE II, CLASS I USING BLACK MARKING INK 1006271-10 CENTRALIZE AS SHOWN
8. TEST PER FTM 10057C7
9. AR DENOTES AS REQUIRED
10. LACE LEADS AWAY FROM JACKING SCREW

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
X	1006184		WIRING DIAGRAM	REF
AR	1006322-004		SLEEVING	10
AR	1006322-001		SLEEVING	9
AR	1012507-001		TAPE, LACING	8
AR	1010789-016		WIRE, ELEC, AWG 26 YEL	7
~~AR~~	~~1007789-017~~		~~WIRE, ELEC, AWG 26, 2 COND TWISTED~~	~~6~~
149	1010738-5		CONTACT, ELEC PIN	5
136	1010738-6		CONTACT, ELEC SOCKET	4
1	1010817-1		CONNECTOR, PLUG ELEC	3
1	1010818-1		CONNECTOR, RECEPTACLE ELEC	2
1	1003217		G & N FAILURE DETECT MODULE	1

LIST OF MATERIALS

1003220	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± .03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN R. Simpson 7/9/65
CHECKED R. Edmond 7/9/65
APPROVED Ed Hamel 7/19/65
APPROVED Ed Chin 7/19/65

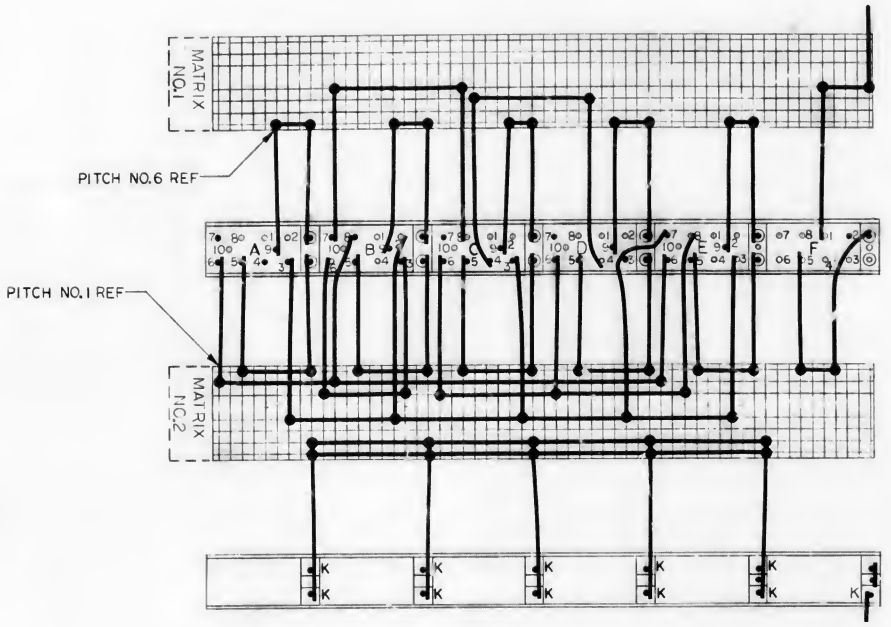
G & N FAILURE DETECT CABLE ASSY

APPROVED MIT W. Hoffman 9/24/65
NOT REQUIRED PER LETTER
APPROVED NASA PP7-65-512

CODE IDENT NO	SIZE	DRAWING NO.
80230	D	1005731

DATE | SCALE 1/1 | SHEET 1 OF

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
–	CLASS A RELEASE PER TDRR 02918	9/5/63	
A	REVISED PER TDRR 04737	11-7-63	
B	REVISED PER TDRR 06050	3/4/64	
C	REVISED PER TDRR 07347 DR B Jensen CHK Cull	4/6/64	



REFERANCE DWG:
1. MECHANICAL ASSY – 1003521

NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. K DENOTES CATHODE SIDE OF DIODE

REFERENCE DWG
1 MECHANICAL ASSY 1003521

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB Cambridge 39, Mass.
DWG. NO. CONTRACT

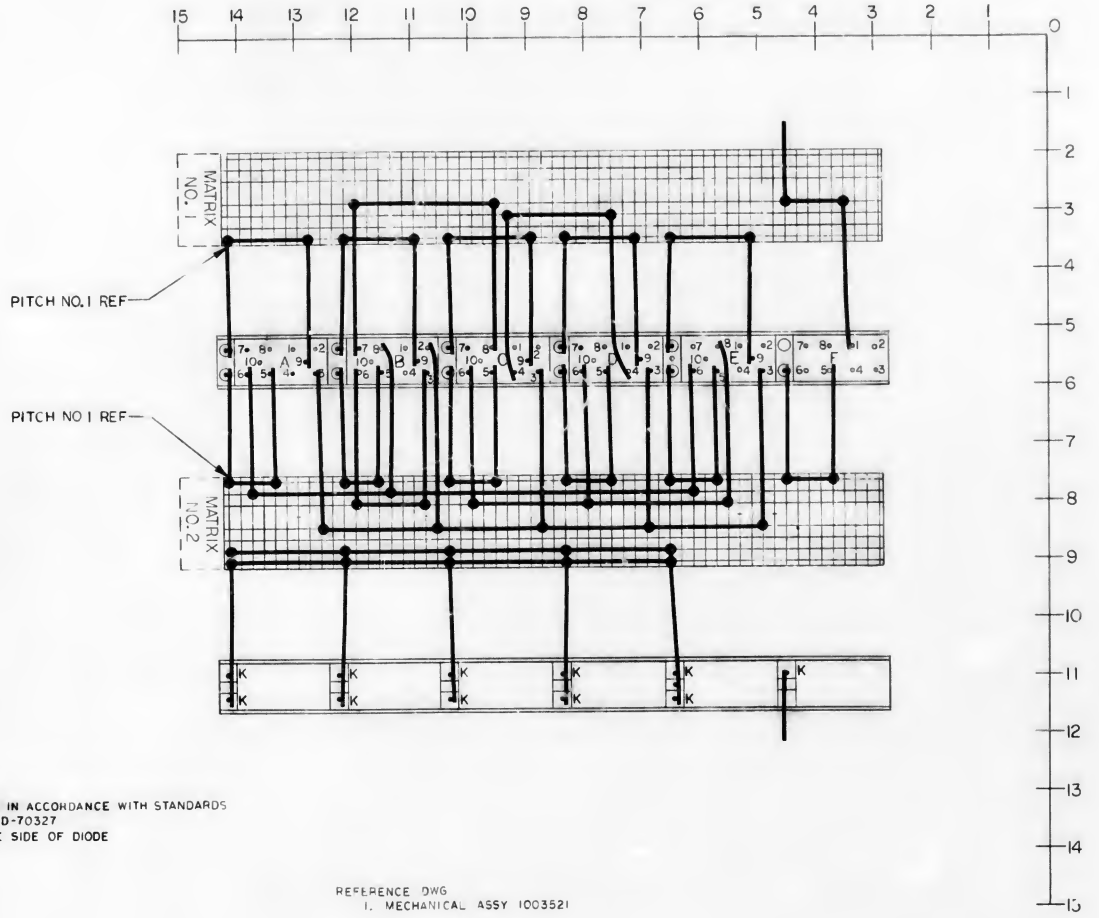
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

DRAWN DATE 2/20/63
CHECKED 26 Feb 63
APPROVAL 26 Feb 63
APPROVAL 5 Mar 63
NASA APPROVAL 4/6/64
MIT APPROVAL
MIT APPROVAL 4/15/64

RELAY STICKS 1 AND 3 WIRING DIAGRAM AGC DSKY, NAV & MAIN

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006110
SCALE 2/1
WT
SHEET 1 OF 1

REVISIONS				
SYM		DESCRIPTION	DATE	APPROVAL
2	–	CLASS A RELEASE PER TDRR 02918	9/5/63	[illegible]
4	A	REVISED PER TDRR 00788	11/4/63	[illegible]
5	B	REVISED PER TDRR 06050	11/[illegible]/63	[illegible]
	C	REVISED PER TDRR 07347 DR [illegible] CHK CWH	16 [illegible] 64	[illegible]



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. K DENOTES CATHODE SIDE OF DIODE

REFERENCE DWG
1. MECHANICAL ASSY 1003521

REFERANCE DWG:
1. MECHANICAL ASSY - 1003521

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

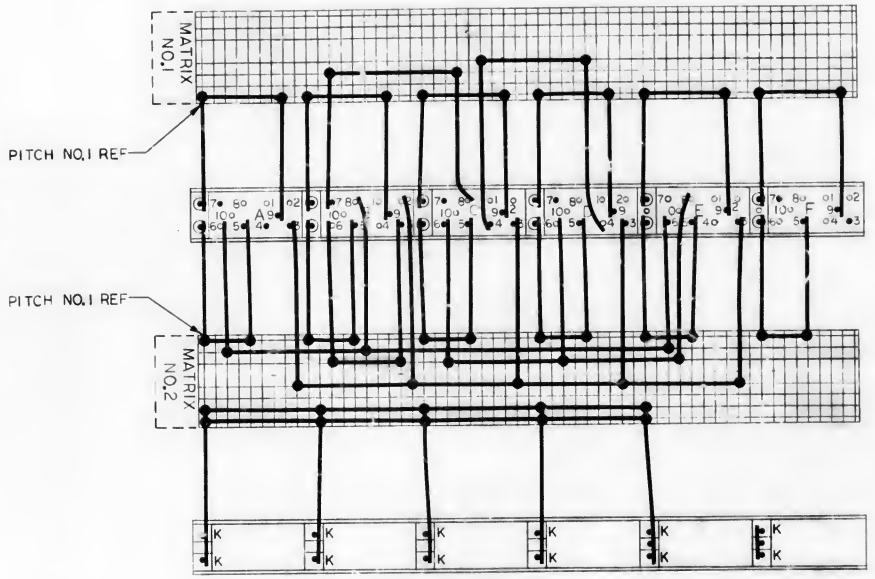
MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 7/1/63
CHECKED [illegible] 2 May 63
APPROVAL [illegible] 2 May 63
APPROVAL [illegible] 3 Sept 63
NASA APPROVAL [illegible] 9/1/63
MIT APPROVAL
MIT APPROVAL [illegible] 9/1/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY STICK 2
WIRING DIAGRAM
AGC DSKY, NAV, MAIN

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1006111
SCALE 2/1 | WT | SHEET 1 OF 1

REVISIONS				
	SYM	DESCRIPTION	DATE	APPROVAL
D	-	CLASS A RELEASE PER TDRR 02910	9/6/63	JH
C	A	REVISED PER TDRR 04745	11-8-63	RPR JH
	B	REVISED PER TDRR 07147 DR [illegible] CHK [illegible]	12/4/64	JH



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. K DENOTES CATHODE SIDE OF DIODE

REFERENCE DRAWING
1. MECHANICAL ASSEMBLY: 1003521

QTY REQD	PART OR IDENTIFING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

M I T INSTRUMENTATION LAB CAMBRIDGE, MASS.
DWG. NO. | CONTRACT

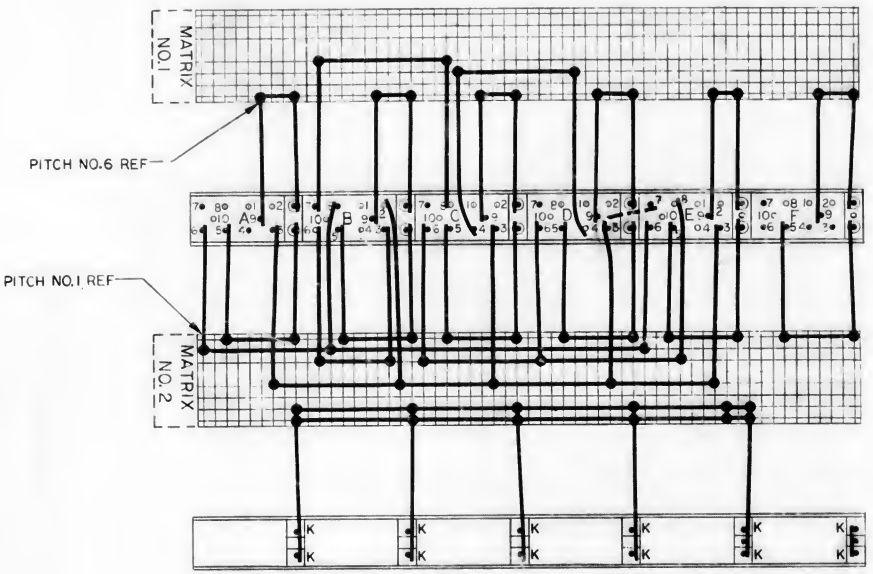
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

DRAWN [illegible] DATE 7/6/63
CHECKED [illegible] 16 Aug 63
APPROVAL [illegible] 21 Aug 63
APPROVAL [illegible] 23 Aug 63
NASA APPROVAL [illegible] 9/6/63
MIT APPROVAL
MIT APPROVAL [illegible] 9/5/63

RELAY STICKS 4 AND 6 WIRING DIAGRAM AGC DSKY, NAV & MAIN

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1006112
SCALE 2/1 | WT | SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	CLASS A RELEASE PER TDRR 02718	9/6/13	JH
A	REVISED PER TDRR 04797	11/26/13	JH
B	REVISED PER TDRR 05394	1/24/14	JH
C	REVISED PER TDRR 07347 DR. [illegible] CHK [illegible]	4/11/14	JH



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. K DENOTES CATHODE SIDE OF DIODE

REFERENCE DRAWING
1. MECHANICAL ASSEMBLY 1003521

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TPEATMENT
FINAL FINISH
NEXT ASSY USED ON
APPLICATION

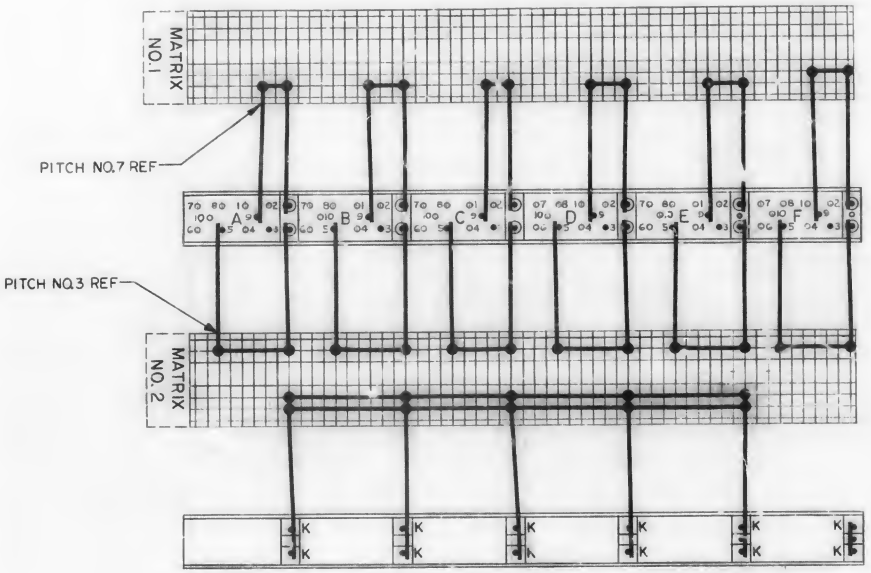
MIT INSTRUMENTATION LAB
Cambridge Mass
DRG NO CONTRACT
DRAWN [illegible] DATE 5/AUG/13
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY STICK 5
WIRING DIAGRAM
AGC DSKY, NAV & MAIN

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006113
SCALE 2/1
WT
SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 0291A	11/8/63	DM
A	REVISED PER TDRR 0413A	12/26/63	DM



NOTES
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. K DENOTES CATHODE SIDE OF DIODE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES °
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

M I T INSTRUMENTATION LAB CAMBRIDGE, MASS.
DRAWN Ed Primm DATE 5/17/63
CHECKED [illegible] 28 May 63
APPROVAL [illegible] 4 Sept 63
APPROVAL [illegible] 5 Sept 63
NASA APPROVAL [illegible] 9/13/63
MIT APPROVAL
MIT APPROVAL [illegible] 9/16/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

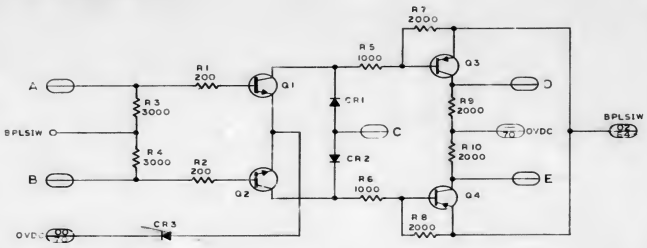
RELAY STICK 7 WIRING DIAGRAM AGC DSKY, NAVS MAIN

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1006117
SCALE 2/1 | WT | SHEET 1 OF 1

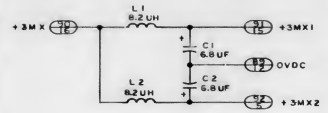
1006117 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
A	REVISED PER TDRR 3401	1/14/67	
B	REVISED PER TDRR 0004	2/14/67	
C	REVISED PER TDRR D6232	4/17/68	
D	REVISED PER TDRR 0726 DR # CHK Carl	9/16/68	
E	REVISED PER TDRR 07670 DR # HK	10/4/68	

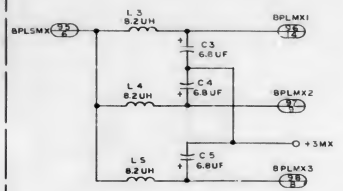
3 IDENTICAL CIRCUITS
NUMBERS 40501, 40502, 40503



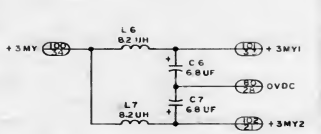
CIRCUIT NO. 40510



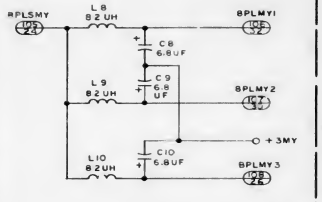
CIRCUIT NO. 40511



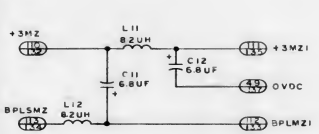
CIRCUIT NO. 40512



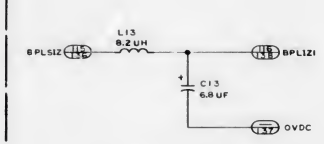
CIRCUIT NO. 40513



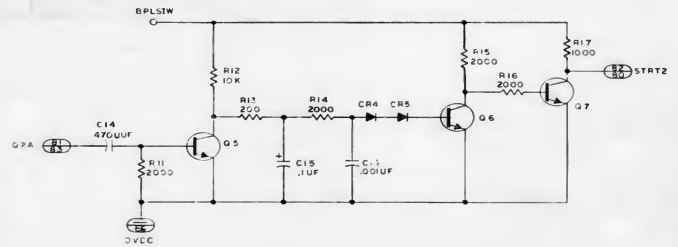
CIRCUIT NO. 40514



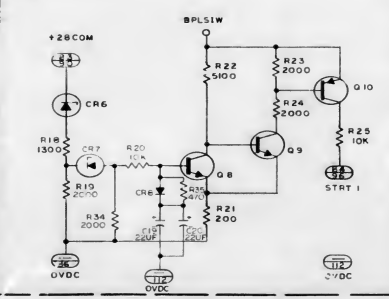
CIRCUIT NO. 40515



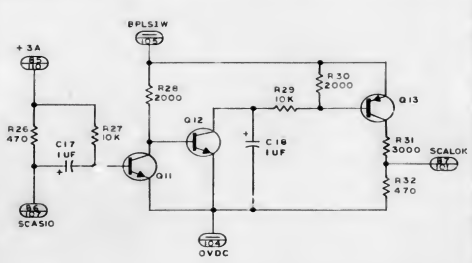
CIRCUIT NO. 40516



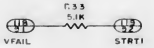
CIRCUIT NO. 40517



CIRCUIT NO. 40518



CIRCUIT NO. 40519



NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS

COMPONENT PREFIX (ASSY)	CIRCUIT NO.	A			B			C			D			E		
		SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5
1	40501	RPG1	10	49	RPG4	13	47	GATER	20	53	GTRS	30	57	GTVS	33	55
2	40502	RPG2	11	61	RPG5	14	59	GATES	21	65	GTSS	31	69	GTVS	34	67
3	40503	RPG3	12	73	RPG6	15	71	GATET	22	77	GTTS	32	81	GTWS	35	79

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MAT'L'S	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY | USED ON
APPLICATION

M.I.T. INSTRUMENTATION LAB Cambridge, Mass.
DRAWN G. B. Allen DATE 4-24-68
CHECKED
APPROVAL
APPROVAL 4-24-68
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

SCHEMATIC, STRAND GATE MODULE B31

CODE IDENT NO. | SIZE E | NASA DRAWING NO. 1006148
SCALE | WT | SHEET 1 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 04078		
B	REVISED PER TDRR 06046		
C	REVISED PER TDRR 06232		
D	REVISED PER TDRR 07269 DR CHK		
E	REVISED PER TDRR 07670 DR CHK		

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
R1	1006750 -15	RESISTOR	200	± 2%	1/4W	
R2	-15		200			
R3	-43		3000			
R4	-43		3000			40501
R5	-32		1000			40502
R6	-32		1000			40503
R7	-39		2000			
R8	-39		2000			
R9	-39		2000			
R10	-39		2000			
R11	-39		2000			
R12	-56		10K			
R13	-15		200			
R14	-39		2000			40516
R15	-39		2000			
R16	-35		2000			
R17	-32		1000			
R18	-35		1300			
R19	-39		2000			
R20	-56		10K			
R21	-15		200			40517
R22	-49		5100			
R23	-39		2000			
R24	-39		2000			
R25	-56		10K			
R26	-24		470			
R27	-56		10K			
R28	-39		2000			
R29	-56		10K			40518
R30	-39		2000			
R31	-43		3000			
R32	-24		470			
R33	-49		5IK			40519
R34	-39		2000			40517
R35	-24		470			
C1	1006755 -79	CAPACITOR	6.8UF	±10%	35VDC	40510
C2	-					
C3	-					
C4	-					40511
C5	-					
C6	-					40512
C7	-					
C8	-					
C9	-					40513
C10	-					
C11	-					
C12	-					40514
C13	1006755 -79		6.8UF		35VDC	40515
C14	1006777 -20		470UUF		100VDC	
C15	1006755 -57		0.1 UF		35VDC	40516
C16	1036777 -24		.001 UF		100VDC	
C17	1006755 -69		1.0 UF		35VDC	
C18	1006755 -69		1.0 UF		35VDC	40518
C19	1006755 -134		22 UF		50VDC	
C20	1006755 -134		22 UF		50VDC	40517

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
J	1010406-7	INDUCTOR	8.2 UH			40510
L2						
L3						
L4						40511
L5						
L6						40512
L7						
L8						
L9						40513
L10						
L11						40514
L12						
L13						40515
CR1	1006751	DIODE				40501
CR2						40502
CR3						40503
CR4						40516
CR5	1006751					
CR6	1006838					40517
CR7	1006838					
CR8	1006751					
Q1	1006752	TRANSISTOR				40501
Q2	1006752					40502
Q3	1006753					40503
Q4	1006753					
Q5	1006752					40516
Q6						
Q7						
Q8						40517
Q9						
Q10	1006753					
Q11	1006752					
Q12	1006752					40518
Q13	1006753					

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY USED ON
APPLICATION

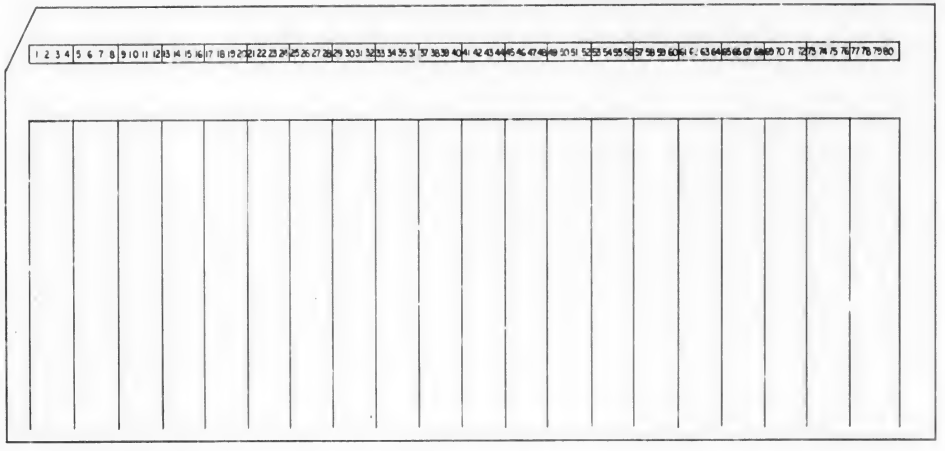
MIT INSTRUMENTATION LAB
DRAWN C. Pilon DATE 4/24/67
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC,
STRAND GATE MODULE B31

CODE IDENT NO.	SIZE	NASA DRAWING NO
	E	1006148
SCALE	WT	SHEET 2 OF 2

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR #5629	4/1/66	
B	REVISED PER TDRR 02503	6/14/66	



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2 - 7	CARD SEQUENCE NUMBER, IN DECIMAL
9 - 22 USAGE	BINARY MACHINE DATA, IN THE FORMAT DESCRIBED BY A GARDNER-DENVER CO. DRAWING NUMBER 800384, REVISION A, FOR THEIR MODEL 14F-15X15X.125 WIRE-WRAP MACHINE
27 - 33	SIGNAL NAME.
34 - 35	WIRE NUMBER IN CHAIN FOR SIGNAL.
36 - 42	NAME OF PIN WRAPPED BY A TOOL
43 - 49	NAME OF PIN WRAPPED BY B TOOL
50	WIRE PATTERN CODE NUMBER
51	TABLE ROTATIONAL POSITION
52	PALLET LONGITUDINAL POSITION
53	A TOOL Z LEVEL
54	B TOOL Z LEVEL
55 - 57	A TOOL X, IN DECIMAL
58 - 60	Y1, IN DECIMAL
61 - 63	B TOOL X, IN DECIMAL
64 - 66	Y2, IN DECIMAL
67 - 69	Y3, IN DECIMAL
70 - 72	Y4, IN DECIMAL
73 - 79	NASA DRAWING NUMBER OF COVER SHEET FOR DECK
80	REVISION LETER TO DRAWING NUMBER

REF DRAWING NUMBER 1003163

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OF DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

M.I.T. INSTRUMENTATION LAB, CAMBRIDGE MASS.
DRAWN [signature] DATE 6/1/66
CHECKED
APPROVAL
APPROVAL [signature]
NASA APPROVAL [signature] 6/14/66
MIT APPROVAL [signature] 6/16/66

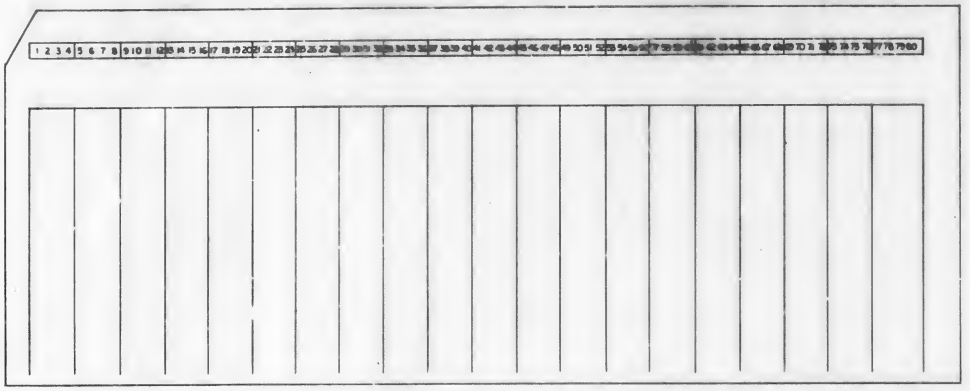
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIREWRAP CARD DECK-TRAY A L.H.

CODE IDENT NO. —
SIZE D
NASA DRAWING NO. 1006151
SCALE NONE
WT
SHEET 1 OF 1

1006151 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629		
B	REVISED PER TDRR 07509	4/26/69	
C	REVISED PER TDRR 08854 DR CHK	9 JUN 69	AWC
D	REVISED PER TDRR 09793 DR CHK	8/3/69	



DWG REV	DECK REV	TDRR	SYS EFF
C	C	08854	5
D	D	09793	5

NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2 – 7	CARD SEQUENCE NUMBER, IN DECIMAL
9 – 22	BINARY MACHINE DATA, IN THE FORMAT DESCRIBED BY GARDNER-DENVER CO. DRAWING NUMBER 800384 REVISION A, FOR THEIR MODEL 14F-15X15X.125 WIRE-WRAP MACHINE
27 – 33	SIGNAL NAME.
34 – 35	WIRE NUMBER IN CHAIN FOR SIGNAL.
36 – 42	NAME OF PIN WRAPPED BY A TOOL
43 – 49	NAME OF PIN WRAPPED BY B TOOL
50	WIRE PATTERN CODE NUMBER
51	TABLE ROTATIONAL POSITION
52	PALLET LONGITUDINAL POSITION
53	A TOOL Z LEVEL
54	B TOOL Z LEVEL
55 – 57	A TOOL X, IN DECIMAL
58 – 60	Y1, IN DECIMAL
61 – 63	B TOOL X, IN DECIMAL
64 – 66	Y2, IN DECIMAL
67 – 69	Y3, IN DECIMAL
70 – 72	Y4, IN DECIMAL
73 – 79	NASA DRAWING NUMBER OF COVER SHEET FOR DECK
80	REVISION LETTER TO DRAWING NUMBER

REF DRAWING NUMBER 1003164

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH

M I T INSTRUMENTATION LAB CAMBRIDGE MASS

DRAWN DATE
CHECKED
APPROVED
APPROVED
NASA APPROVAL

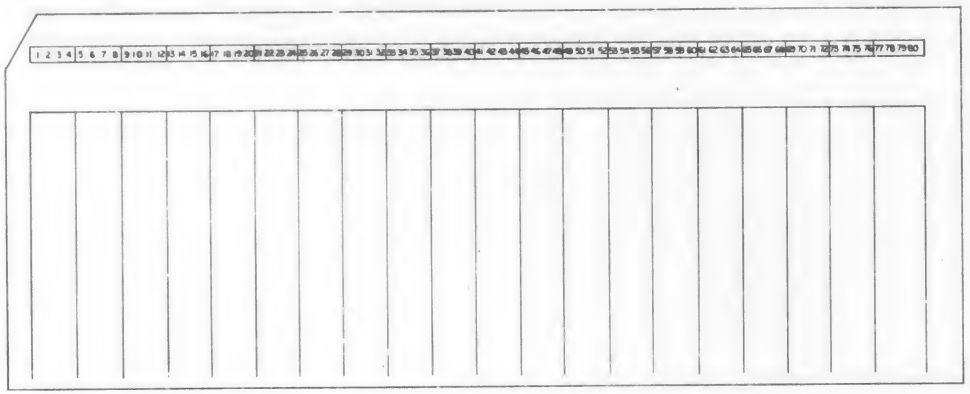
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

WIREWRAP CARD DECK-TRAY A R.H.

CODE IDENT NO. | SIZE D | NASA DRAWING NO. 1006152

SCALE | SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 0 5627		
B	REVISED PER TDRR 0 7506	4/3/69	



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2 – 7	CARD SEQUENCE NUMBER, IN DECIMAL
9 – 22 USAGE	BINARY MACHINE DATA, IN THE FORMAT DESCRIBED BY GARDNER-DENVER CO. DRAWING NUMBER 800384, REVISION A, FOR THEIR MODEL 14F-15X15X.125 WIRE WRAP MACHINE
27 – 33	SIGNAL NAME.
34 – 35	WIRE NUMBER IN CHAIN FOR SIGNAL.
36 – 42	NAME OF PIN WRAPPED BY A TOOL
43 – 49	NAME OF PIN WRAPPED BY B TOOL
50	WIRE PATTERN CODE NUMBER
51	TABLE ROTATIONAL POSITION
52	PALLET LONGITUDINAL POSITION
53	A TOOL Z LEVEL
54	B TOOL Z LEVEL
55 – 57	A TOOL X, IN DECIMAL
58 – 60	Y1, IN DECIMAL
61 – 63	B TOOL X, IN DECIMAL
64 – 66	Y2, IN DECIMAL
67 – 69	Y3, IN DECIMAL
70 – 72	Y4, IN DECIMAL
73 – 79	NASA DRAWING NUMBER OF COVER SHEET FOR DECK
80	REVISION LETER TO DRAWING NUMBER

REF DRAWING NUMBER 1003176

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	M I T INSTRUMENTATION LAB Cambridge Mass
TOLERANCES ON FRACTIONS DECIMALS ANGLES	DRAWN D. Oliver DATE 6 Dec 68
DO NOT SCALE THIS DRAWING	CHECKED
MATERIAL	APPROVAL
HEAT TREATMENT	APPROVAL D. Hall 7 Jan 69
FINAL FINISH	NASA APPROVAL
NEXT ASSY / USED ON	MIT APPROVAL
APPLICATION	

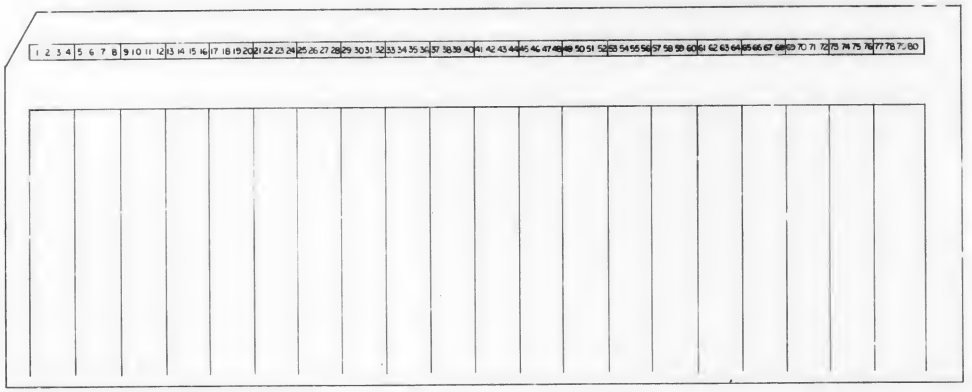
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIREWRAP CARD DECK-TRAY B L.H.

CODE IDENT NO	SIZE	NASA DRAWING NO
	D	1006153

SCALE NONE WT SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629	[illegible]	[illegible]
B	REVISED PER TDRR 09510	4/26/67	[illegible]



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2 – 7	CARD SEQUENCE NUMBER, IN DECIMAL
9 – 22	USAGE BINARY MACHINE DATA, IN THE FORMAT DESCRIBED BY GARDNER-DENVER CO. DRAWING NUMBER 800384 REVISION A, FOR THEIR MODEL 14F-15X15X.125 WIRE-WRAP MACHINE
27 – 33	SIGNAL NAME.
34 – 35	WIRE NUMBER IN CHAIN FOR SIGNAL.
36 – 42	NAME OF PIN WRAPPED BY A TOOL
43 – 49	NAME OF PIN WRAPPED BY B TOOL
50	WIRE PATTERN CODE NUMBER
51	TABLE ROTATIONAL POSITION
52	PALLET LONGITUDINAL POSITION
53	A TOOL Z LEVEL
54	B TOOL Z LEVEL
55 – 57	A TOOL X, IN DECIMAL
58 – 60	Y1, IN DECIMAL
61 – 63	B TOOL X, IN DECIMAL
64 – 66	Y2, IN DECIMAL
67 – 69	Y3, IN DECIMAL
70 – 72	Y4, IN DECIMAL
73 – 79	NASA DRAWING NUMBER OF COVER SHEET FOR DECK
80	REVISION LETER TO DRAWING NUMBER

REF DRAWING NUMBER 1003177

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

M I T INSTRUMENTATION LAB Cambridge Mass.
DRAWN [illegible] DATE 2 Dec 64
CHECKED
APPROVAL
APPROVAL [illegible] 2 Jan 64
NASA APPROVAL [illegible] 1/4/65
MIT APPROVAL [illegible]

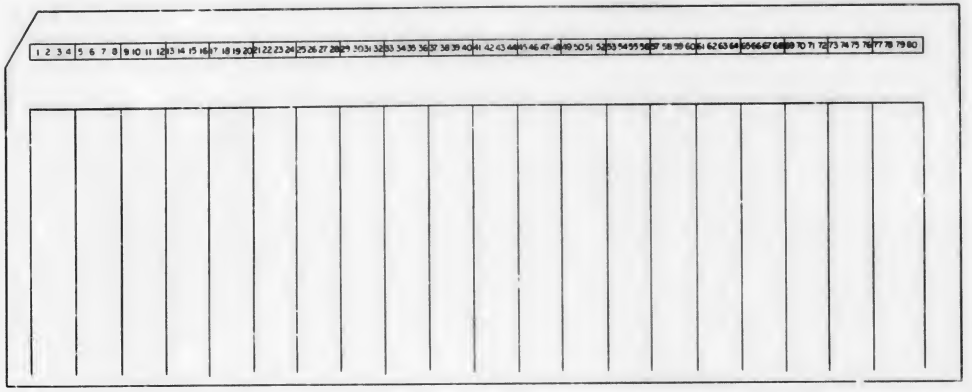
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

WIREWRAP CARD DECK-TRAY B R.H.

CODE IDENT NO. —— | SIZE D | NASA DRAWING NO. 1006154
SCALE NONE | WT | SHEET 1 OF 1

1006154

REVISIONS			
SYM	DESCRIPTION	DATE	APPRC /AL
A	INITIAL RELEASE PER TDRR 05629	1/1/64	[illegible]
B	REVISED PER TDRR 02559	4/24/64	[illegible]
C	REVISED PER TDRR 08856 DR FNDSON CHK ARB	6/4/64	[illegible]
D	REVISED PER TDRR 09794 DR R Smedley CHK [illegible]	9/3/64	[illegible]



DWG REV	DECK REV	TDRR	SYS EFF
C	C	08856	5
D	C	09794	5

NOTES -

1-INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

2-

CARD COL	USAGE
2-5	CARD NUMBER
6-7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
17-23	SIGNAL NAME
33-39	LEFT HALF TERMINAL NAME
49-55	RIGHT HALF TERMINAL NAME
73-79	NASA DRAWING NUMBER
80	REVISON LETTER

REF DRAWING NUMBER 1003200

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

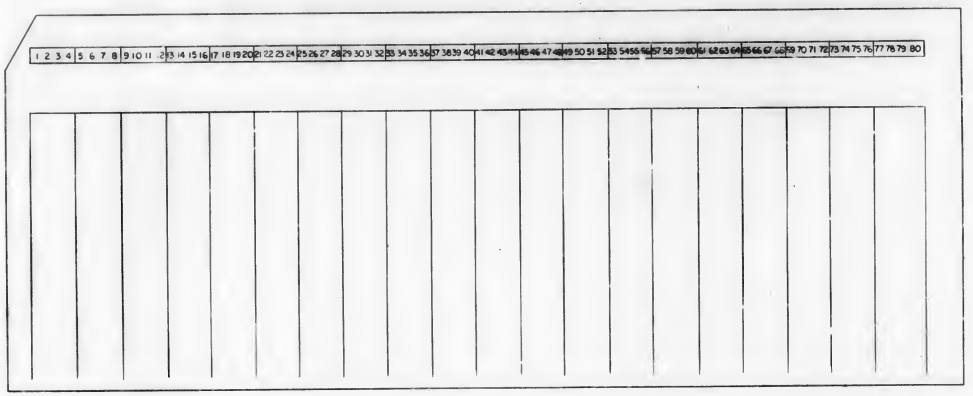
M I T INSTRUMENTATION LAB CAMBRIDGE MASS
DRAWN Madrey DATE 6/24/63
CHECKED
APPROVAL
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

TRAY A LEFT TO RIGHT WIRING

CONF IDENT NO. —
SIZE D
NASA DRAWING NO. 1006155
SCALE
WT
SHEET OF

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629	[illegible]	[illegible]
B	REVISED PER TDRR 05711	9/8/67	WK



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2-5	CARD NUMBER
6-7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18-24	SIGNAL NAME
33-39	MODULE PIN NUMBER
49-54	END CONNECTOR PIN NUMBER (IN SOME CASES, THIS MAY BE ANOTHER MODULE PIN. THEY ARE MARKED WITH THE NOTE "MOD PIN")
73-79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003163

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

NEXT ASSY | USED ON
APPLICATION

M I T INSTRUMENTATION LAB CAMBRIDGE MASS
DWG NO CONTRACT

DRAWN J. Fifield DATE 8/9/66
CHECKED
APPROVAL
APPROVAL [illegible]

NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

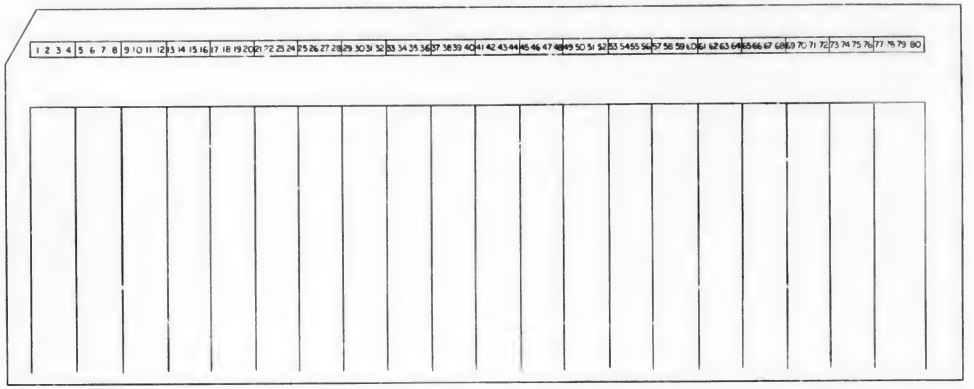
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HAND WIRING FOR TRAY A L.H.

CODE IDENT NO —
SIZE D
NASA DRAWING NO 1006156
SCALE
WT
SHEET OF

1006156

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 1S629	4/1	
B	REVISED PER TDRR 07507	7/24	



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

2-5	CARD NUMBER
6-7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18-24	SIGNAL NAME
33-39	MODULE PIN NUMBER
49-54	END CONNECTOR PIN NUMBER (IN SOME CASES, THIS MAY BE ANOTHER MODULE PIN. THEY ARE MARKED WITH THE NOTE "MOD PIN")
73-79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003164

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

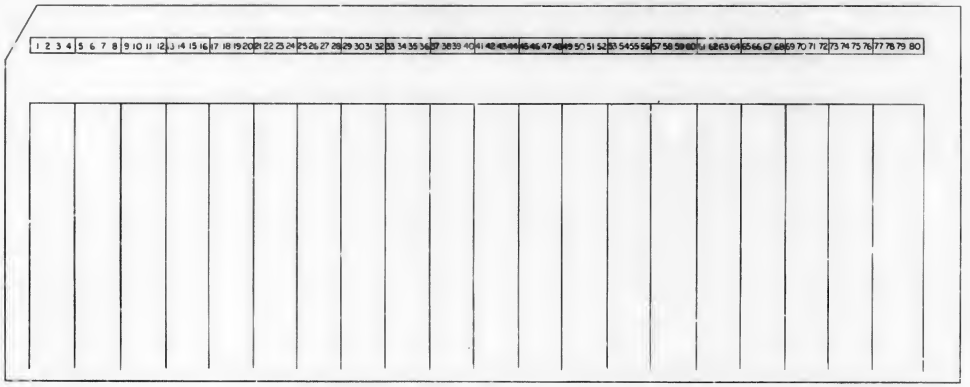
MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DRG NO | CONTRACT
DRAWN J. Fifield DATE 12/15/62
CHECKED
APPROVAL
APPROVAL Edmund Hall 7 Jan 64
NASA APPROVAL [illegible] 1/7/64
MIT APPROVAL [illegible] 1/7/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HAND WIRING FOR TRAY A R.H.

CODE IDENT NO. | SIZE D | NASA DRAWING NO 1006157
SCALE | WT | SHEET OF

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05629	1/14/64	
B	REVISED PER TDRR 07304	4/24/64	



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2-5	CARD NUMBER
6-7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18-24	SIGNAL NAME
33-39	MODULE PIN NUMBER
49-54	END CONNECTOR PIN NUMBER (IN SOME CASES, THIS MAY BE ANOTHER MODULE PIN. THEY ARE MARKED WITH THE NOTE "MOD PIN")
73-79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003176

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS
DRG NO / CONTRACT

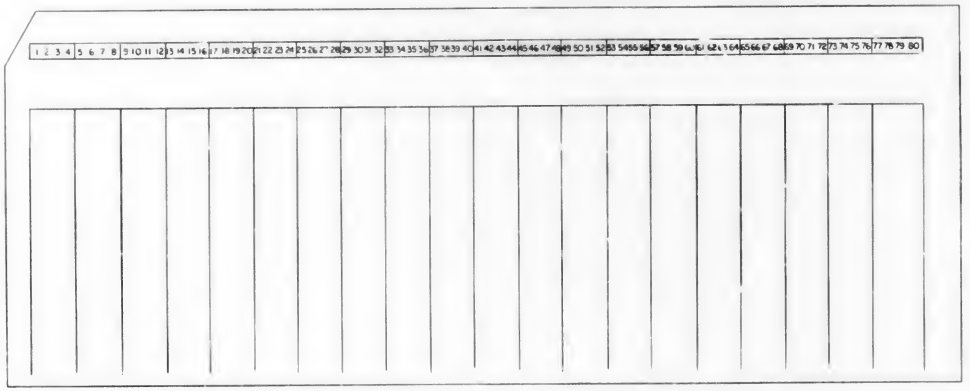
DRAWN J. Fahlk DATE 12/4/63
CHECKED
APPROVAL
APPROVAL Stan C Hall 7 Jan 64
NASA APPROVAL [illegible] 1/16
MIT APPROVAL [illegible] 1/17/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HAND WIRING FOR TRAY B L.H.

CODE IDENT NO ——— | SIZE D | NASA DRAWING NO 1006158
SCALE | WT | SHEET OF

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	INITIAL RELEASE PER TDRR 05679		
B	REVISED PER TDRR 07503		



NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CARD COLUMNS — USAGE

CARD COLUMNS	USAGE
2-5	CARD NUMBER
6-7	INSERTION DIGITS FOR ADDING CARDS
8	VERTICAL FORMAT CONTROL FOR PRINTING
18-24	SIGNAL NAME
33-39	MODULE PIN NUMBER
49-54	END CONNECTOR PIN NUMBER (IN SOME CASES, THIS MAY BE ANOTHER MODULE PIN. THEY ARE MARKED WITH THE NOTE "MOD PIN")
73-79	NASA DRAWING NUMBER
80	REVISION LETTER

REF DRAWING NUMBER 1003177

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON	APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS.

DRAWN J. Fuhrer DATE 6/6/63
CHECKED
APPROVAL
APPROVAL Ethan C. Hall 7 Jun 63
NASA APPROVAL
MIT APPROVAL

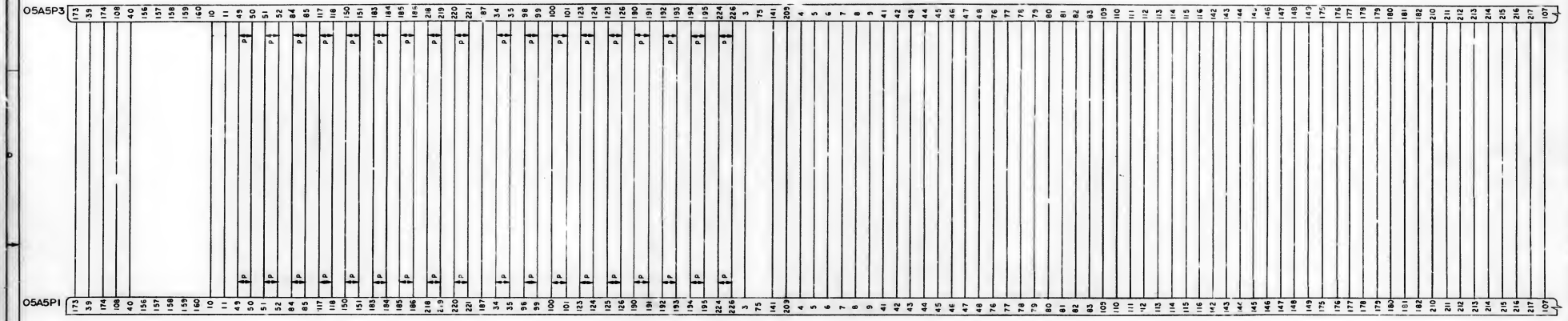
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HAND WIRING FOR TRAY B R.H.

CODE IDENT NO	SIZE	NASA DRAWING NO
———	D	1006159

SCALE WT SHEET OF

1006159

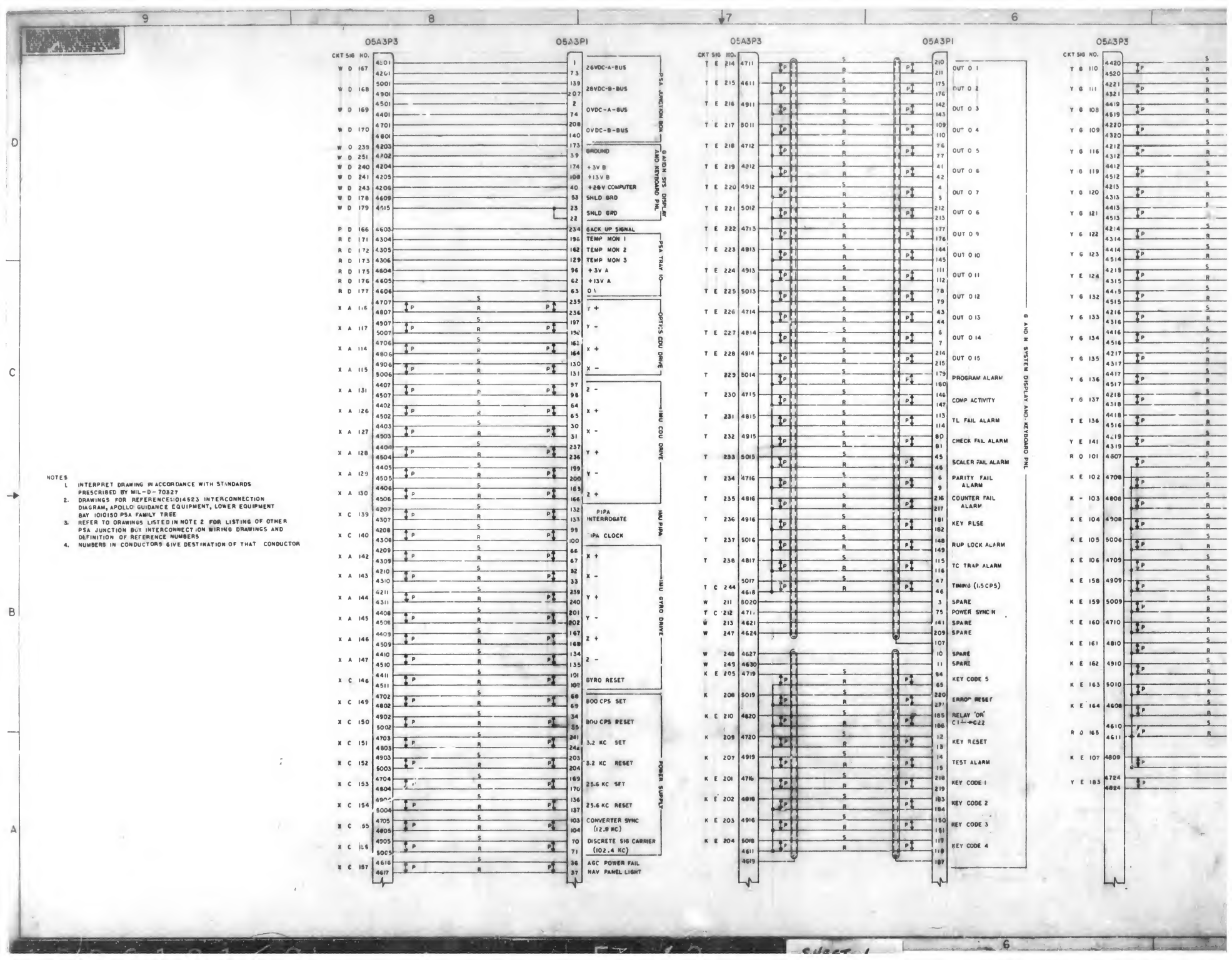


NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

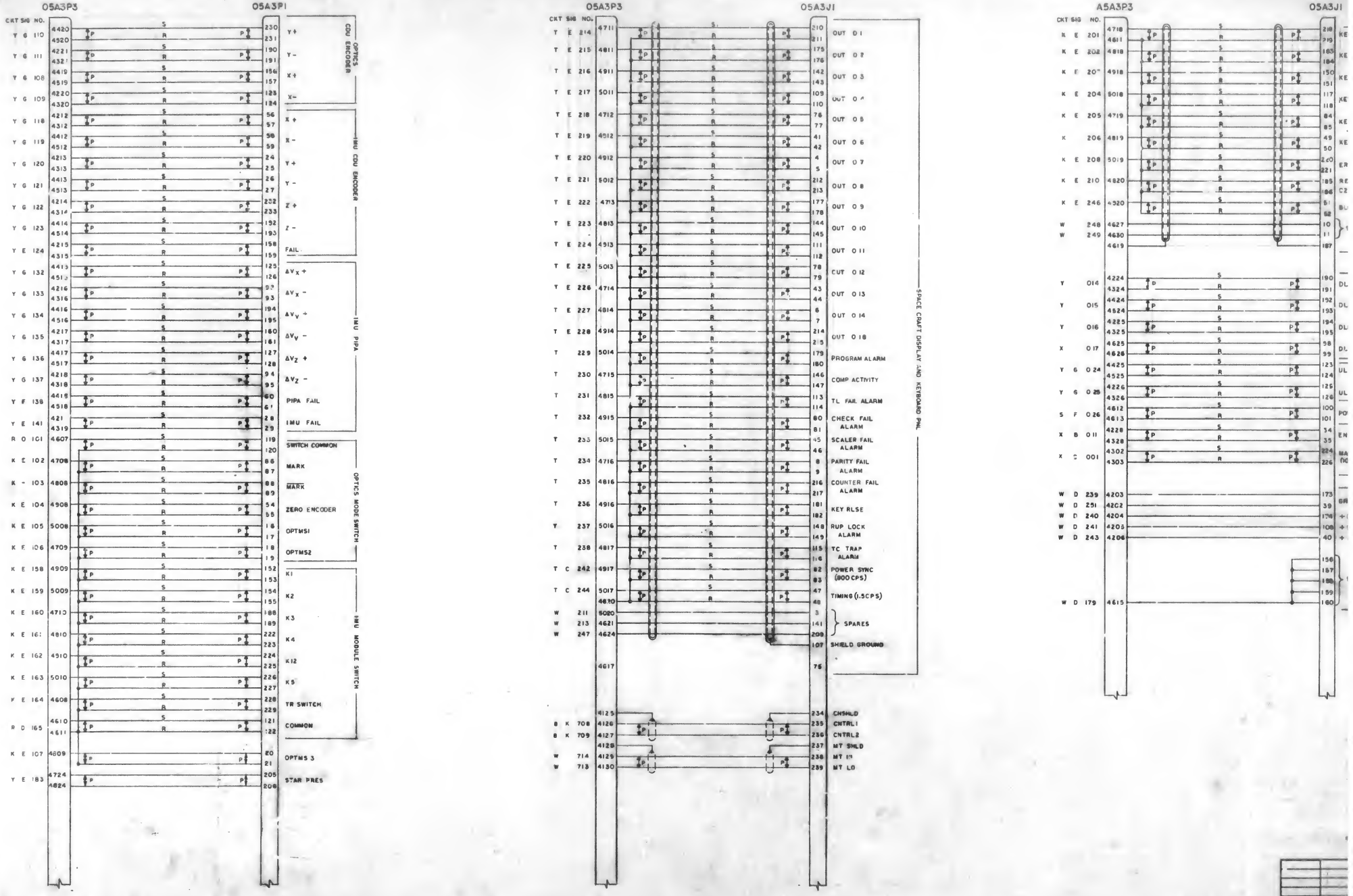
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES .X ±.1 .XX ±.01 .XXX ±.005 ° ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH	NEXT ASSY / USED ON / APPLICATION	MIT INSTRUMENTATION LAB CAMBRIDGE 39 MASS. DRAWN [illegible] DATE 6 APR 67 CHECKED D J Grubbs 7 APR 67 APPROVAL APPROVAL [illegible] NASA APPROVAL [illegible] MIT APPROVAL [illegible]	MANNED SPACECRAFT CENTER HOUSTON, TEXAS WIRING DIAGRAM AGC 05A5P3 – 05A5P1 CAGE IDENT NO. / SIZE E / R/SA DRAWING NO 1006180 SCALE — / WT — / SHEET 1 OF 1



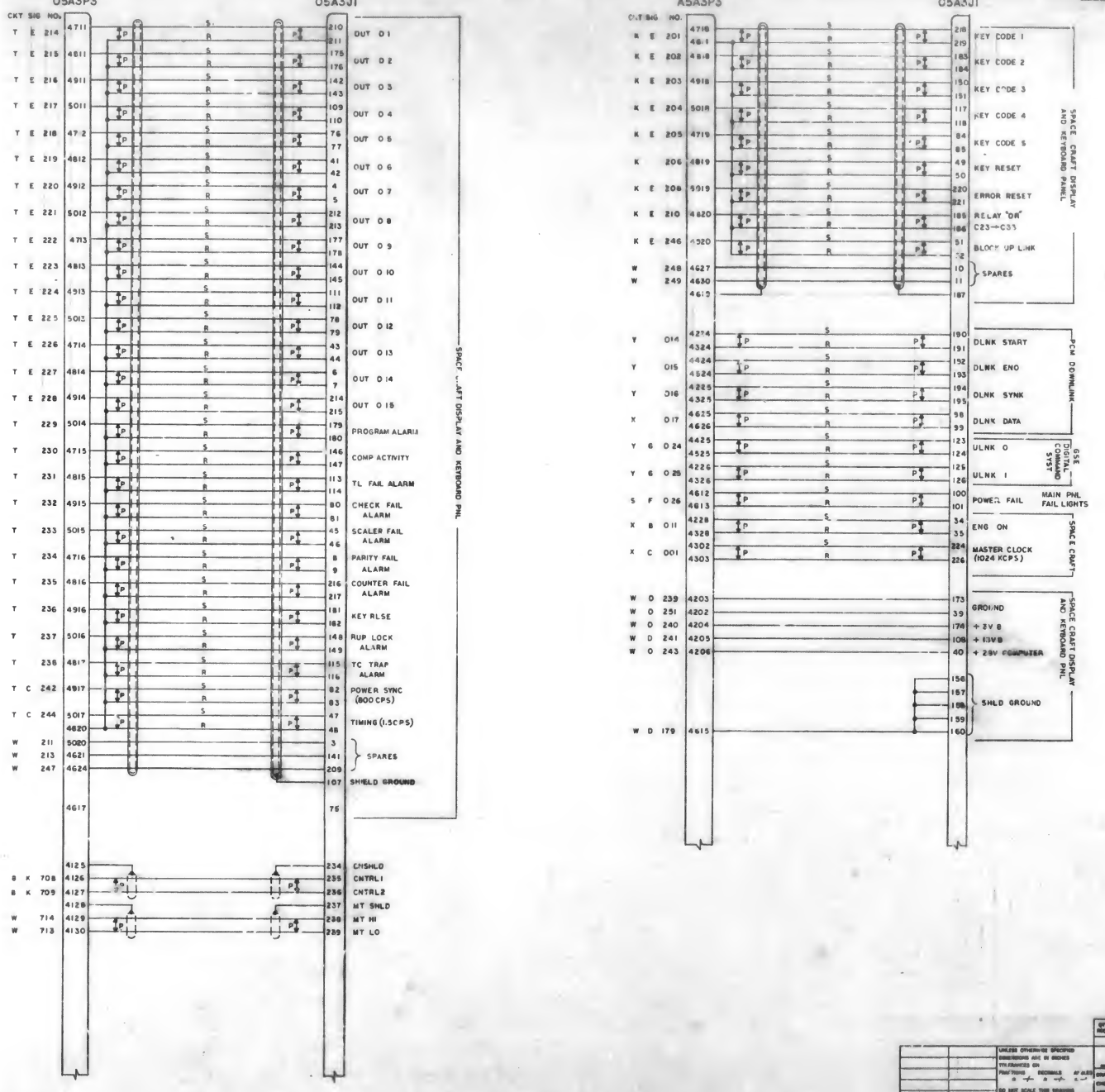
NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. DRAWINGS FOR REFERENCES:1014623 INTERCONNECTION DIAGRAM, APOLLO GUIDANCE EQUIPMENT, LOWER EQUIPMENT BAY 1010150 PSA FAMILY TREE
3. REFER TO DRAWINGS LISTED IN NOTE 2 FOR LISTING OF OTHER PSA JUNCTION BOX INTERCONNECTION WIRING DRAWINGS AND DEFINITION OF REFERENCE NUMBERS
4. NUMBERS IN CONDUCTORS GIVE DESTINATION OF THAT CONDUCTOR



1006181 C

SHEET 1



A	REVISED PER TDRR 05810 DRAWING CHK		
B	REVISED PER TDRR 07108 DRAWING CHK		
C	REVISED PER TDRR 11128 DRAWING CHK		

J 1019001

1019001 C

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

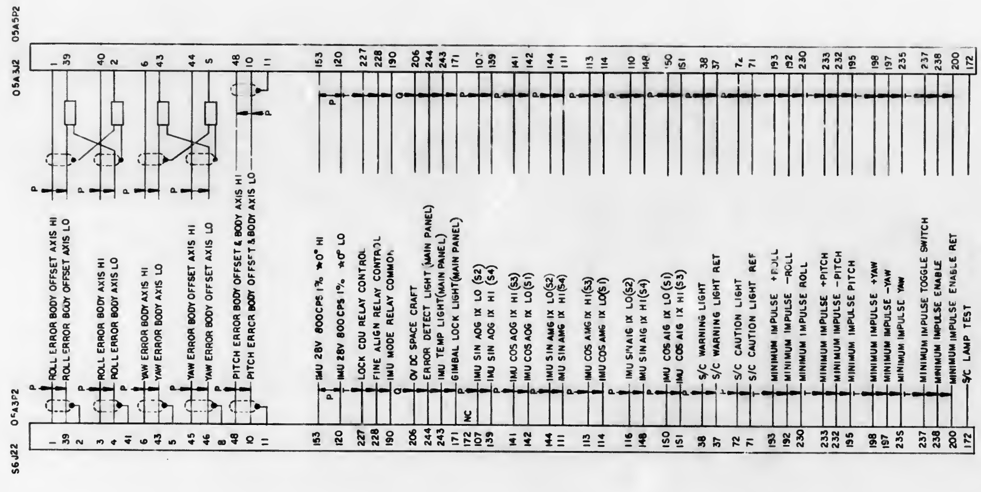
WIRING DIAGRAM
TRAY C

J 1006181

1006181 C

1006181 C

SYM	DESCRIPTION	DATE	APPROVAL
B	THIS SHEET ADDED PER TDRR 07496		
C	REVISED PER TDRR 10128 DRW D.B.J. CHK R.H.E.		



(B) THIS SHEET ADDED PER TDRR 07496

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES

DO NOT SCALE THIS DRAWING

MATERIAL

HEAT TREATMENT

FINAL FINISH

NEXT ASSY | USED ON

APPLICATION

M I T INSTRUMENTATION LAB

DRAWN · CHECKED · APPROVAL · NASA APPROVAL · MIT APPROVAL

MANNED SPACECRAFT CENTER

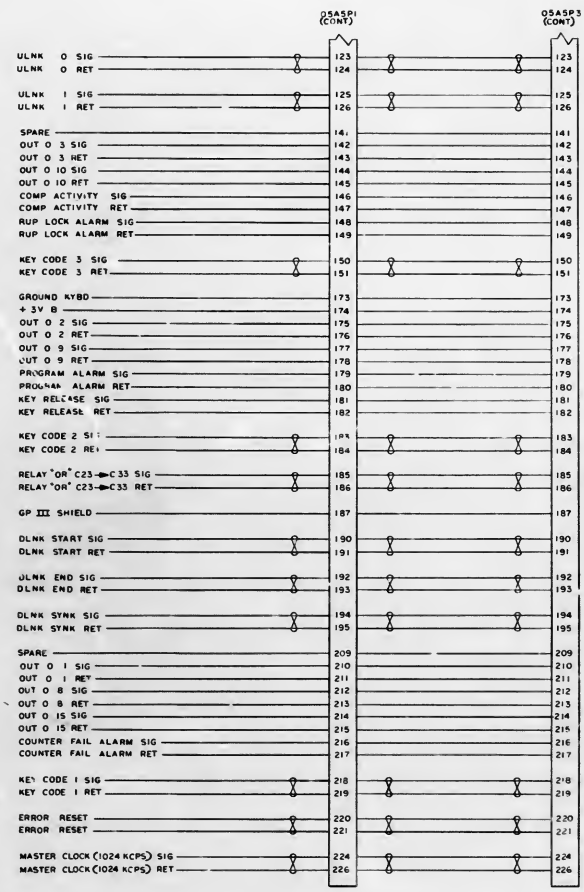
HOUSTON, TEXAS

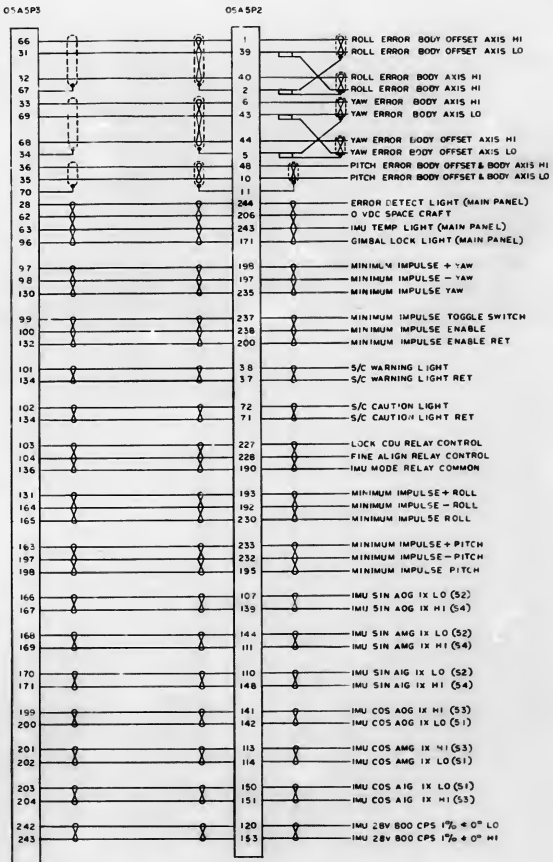
WIRING DIAGRAM TRAY C

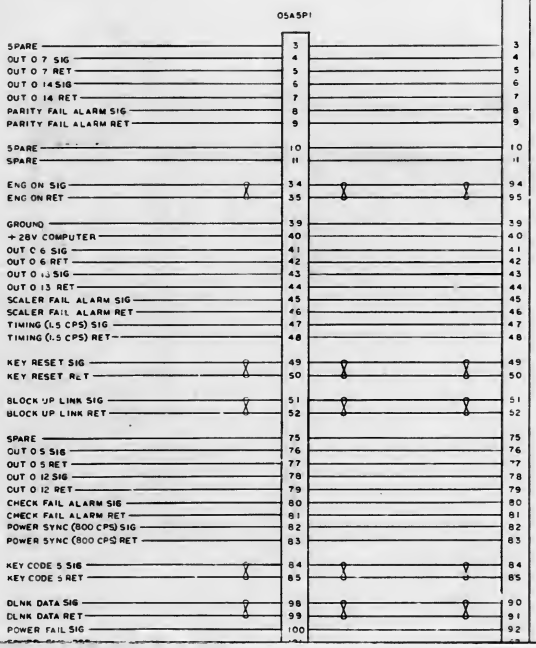
SIZE J · NASA DRAWING NO. 1006181

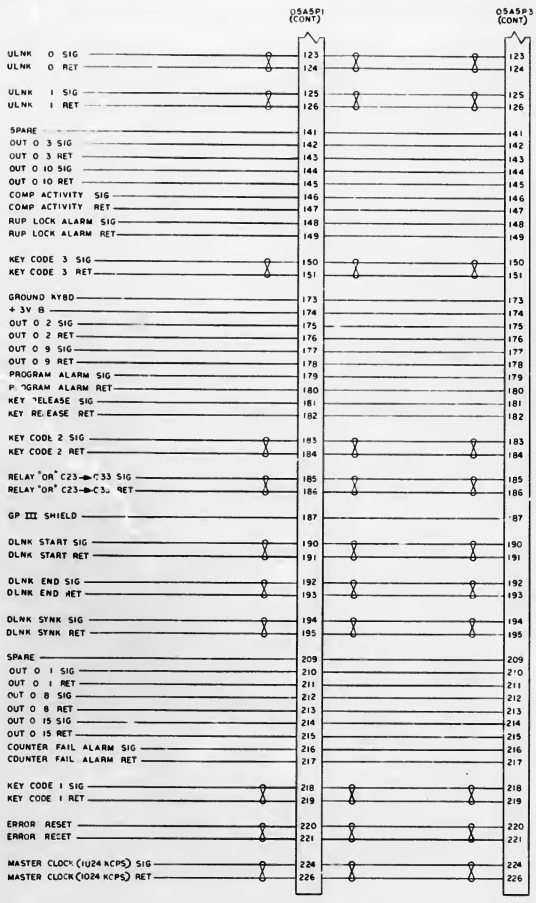
SHEET 2 OF 2

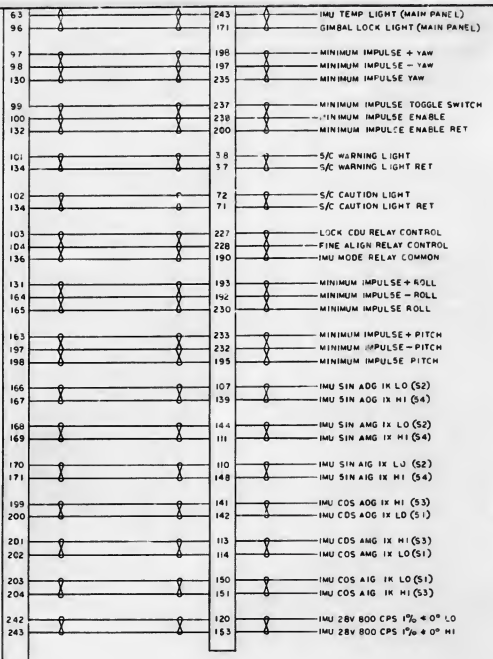
NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

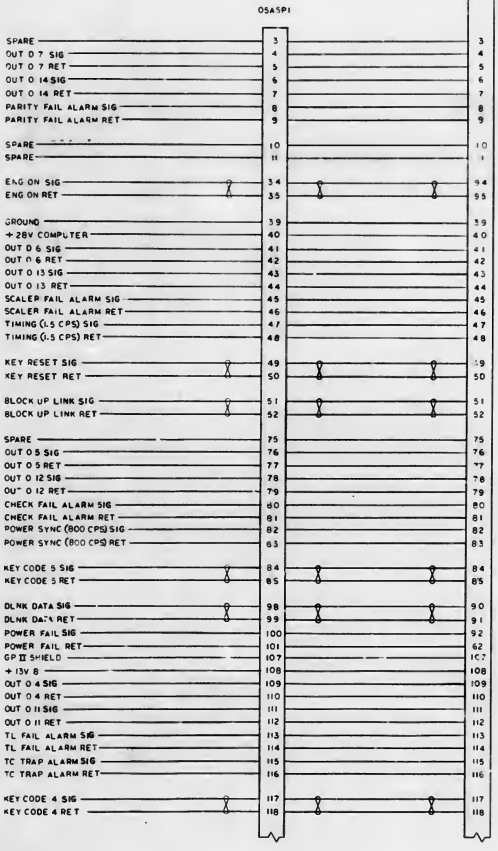












NEXT ASSY | USED ON | APPLICATION

DIMENSIONS ARE IN INCHES. TOLERANCES ON: FRACTIONS ±, DECIMALS .X ±, .XX ±, ANGLES ±. DO NOT SCALE THIS DRAWING. HEAT TREATMENT: SURFACE TREATMENT:

NEXT HIGHER ASSY | MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	REV NO.
		LIST OF MATERIALS	

DRAWN		MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
CHECKED			
ENGR APPROVAL			
MFG APPROVAL			
QUALITY APPROVAL			
PROJ APPROVAL			

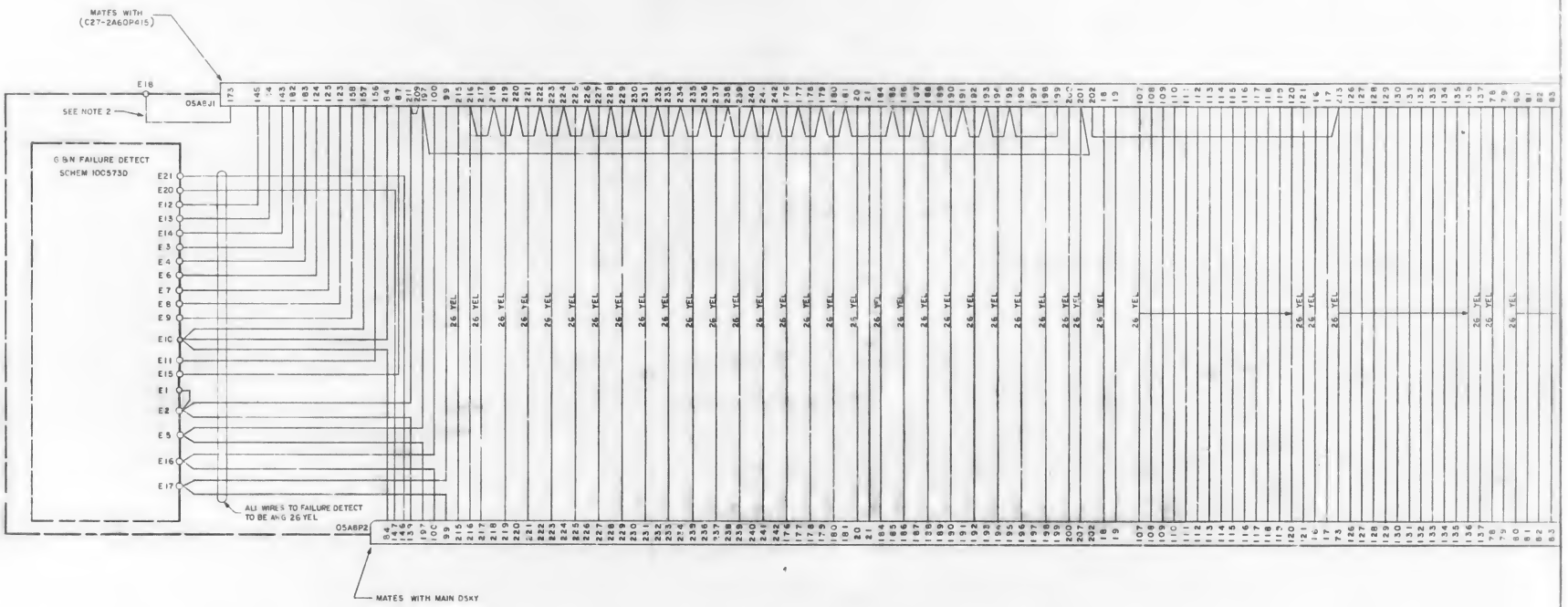
INTERCONNECTION DIAGRAM
CONNECTOR COVER PLATE ASSEMBLY

SIZE	CODE IDENT NO	DRAWING NO
J		1006183

SCALE NONE | WT | SHEET 1 OF 1

1006183 —

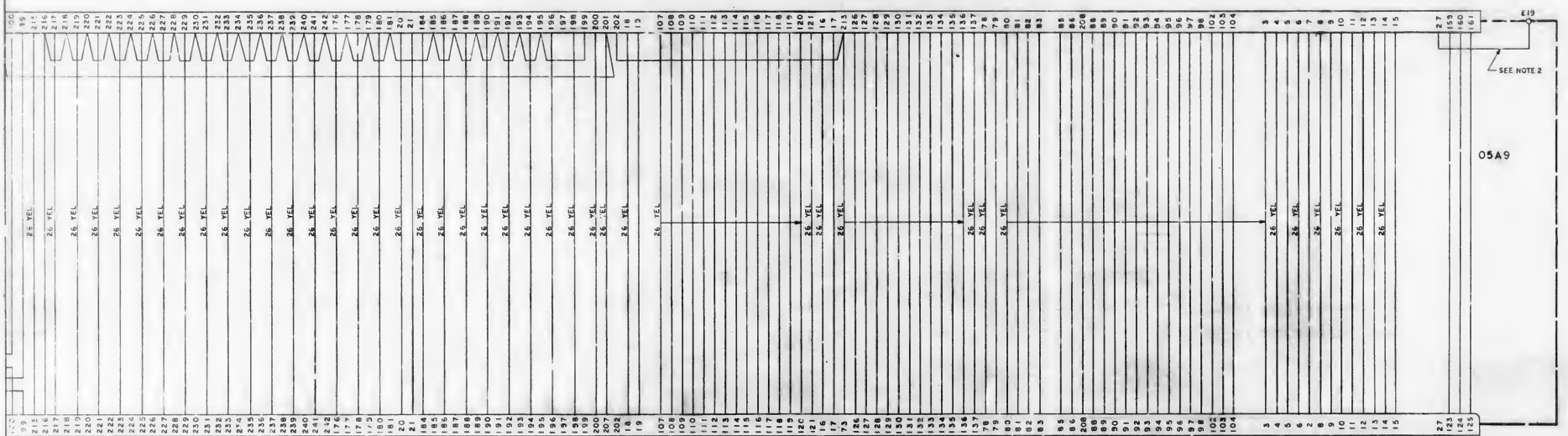
1006183 —



NOTES

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. CASE GROUND LEADS SHOULD BE AS SHORT AS POSSIBLE

REVISIONS				
SYM	ZONE	DESCRIPTION	BY	APPD
A		REVISED PER TDRR 2044		
B		REVISED PER TDRR 21816		
C		REVISED PER TDRR 22459		



QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES CAPACITOR VALUES ARE IN μf RESISTOR VALUES ARE IN OHMS TOLERANCES ON FRACTIONS DECIMALS ANGLES

DO NOT SCALE THIS DRAWING

MATERIAL

NEXT ASSY | USED ON

APPLICATION

MIT INSTRUMENTATION LAB CAMBRIDGE MASS

DRAWN | DATE

CHECKED

APPROVED

APPROVED MIT | DATE

APPROVED NASA | DATE

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

WIRING DIAGRAM, G&N FAILURE DETECT

COST IDENT NO. 80230 | SIZE J | DRAWING NO. 1006184

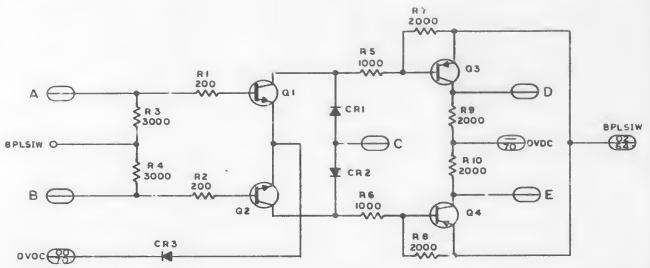
SCALE | SHEET 1 OF 1

MASTER

F-2/2

1006184 C

3 IDENTICAL CIRCUITS
NUMBERS 40501, 40502, 40503



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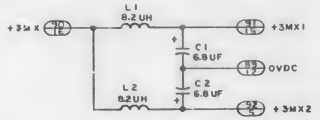
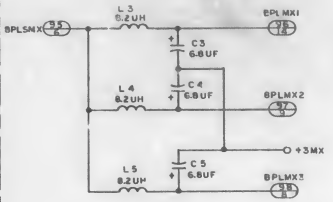
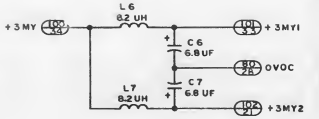


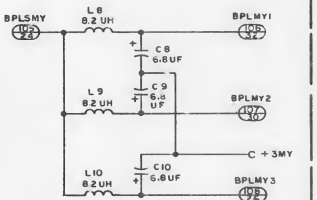
CIRCUIT NO. 40511



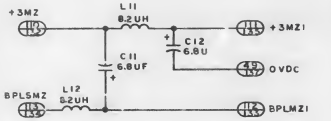
CIRCUIT NO. 40512



CIRCUIT NO. 40513



CIRCUIT NO. 40514



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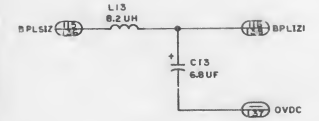
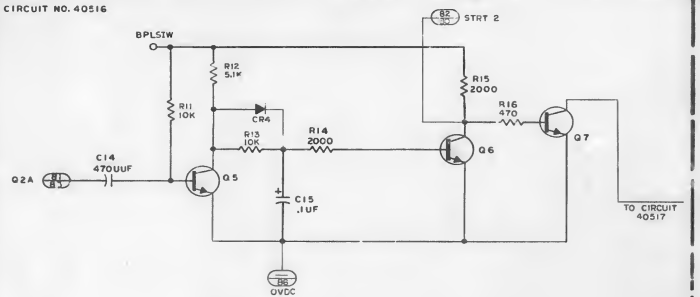
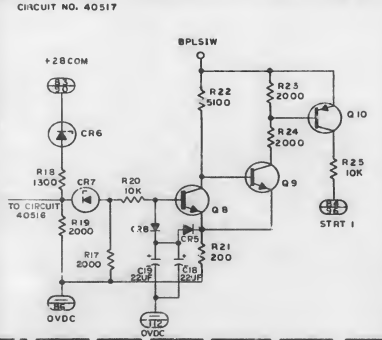


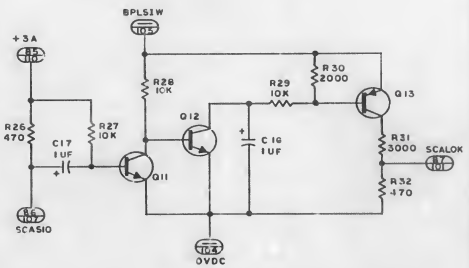
CIRCUIT NO. 40516



CIRCUIT NO. 40517



CIRCUIT NO. 40518



CIRCUIT NO. 40519

REF ASSEMBLY DWG 1003470

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
2. UNLESS OTHERWISE SPECIFIED, RESISTOR VALUES ARE IN OHMS

COMPONENT PREFIX (ASSY)	CIRCUIT NO.	A			B			C			D			E		
		SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5	SIG	PIN NO. AGC 4	PIN NO. AGC 5
1	40501	RPG1	10	49	RPG4	13	47	GATER	20	53	GTRS	30	57	GTUS	33	55
2	40502	RPG2	11	61	RPG5	14	59	GATES	21	65	GTSS	31	69	GTVS	34	67
3	40503	RPG3	12	73	RPG6	15	71	GATET	22	77	GTTS	32	81	GTWS	35	79

(-) REPLACES 1006148 AFTER SYSTEM NO. 20 WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DEC MALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH NEXT ASSY USED ON APPLICATION

MIT INSTRUMENTATION LAB Cambridge, Mass.
DRAWN W. Bonaparte DATE 3/6/68
CHECKED R. Eckhardt / C. Cahill
APPROVAL C. Cahill
APPROVAL J. Miller
NASA APPROVAL Robert L. Hall 3/6/68
MIT APPROVAL D. Hoag 3/6/68

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

SCHEMATIC, STRAND GATE MODULE B31

CODE IDENT NO. — SIZE E NASA DRAWING NO. 1006189
SCALE — WT — SHEET 1 OF 2

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
R1	1006750 - 15	RESISTOR	200	± 2%	1/4 W	
R2	-15		200			
R3	-43		3000			
R4	-43		3000			40501
R5	-32		1000			40502
R6	-32		1000			40503
R7	-39		2000			
R8	-39		2000			
R9	-39		2000			
R10	-39		2000			
R11	-56		10K			
R12	-49		5100			
R13	-56		10K			
R14	-39		2000			40516
R15	-39		2000			
R16	-24		470			
R17	-38		2000			
R18	-35		1300			
R19	-39		2000			
R20	-56		10K			
R21	-15		200			40517
R22	-49		5100			
R23	-39		2000			
R24	-39		2000			
R25	-56		10K			
R26	-24		470			
R27	-56		10K			
R28	-56		10K			
R29	-56		10K			40518
R30	-39		2000			
Ru1	-43		3000			
R32	-24		470			
R33	-49		5IK			40519
C1	1006755 - 79	CAPACITOR	6.8UF	±10%	35VDC	40510
C2	-					
C3	-					
C4	-					40511
C5	-					
C6	-					40512
C7	-					
C8	-					
C9	-					40513
C10	-					
C11	-					
C12	-					40514
C13	1006755 - 79		6.8UF		35VDC	40515
C14	1006777 - 20		470 UUF		100VDC	
C15	1006755 - 57		0.1 UF		35VDC	40516
C16	1006755 - 69		1.0 UF		35VDC	40518
C17	1006755 - 69		1.0 UF		35 VDC	
C18	1006755 -134		22 UF		50VDC	
C19	1006755 -134		22 UF		50VDC	40517

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING	CIRCUIT NO. USED ON
L1	1010406 - 7	INDUCTOR	8.2 UH			40510
L2						
L3						
L4						40511
L5						
L6						40512
L7						
L8						
L9						40513
L10						
L11						40514
L12						
L13						40515
CR1	1006751	DIODE				40501
CR2						40502
CR3						40503
CR4						40516
CR5	1006751					
CR6	1006838					
CR7	1006838					40517
CR8	1006751					
Q1	1006752	TRANSISTOR				40501
Q2	1006752					40502
Q3	1006753					40503
Q4	1006753					
Q5	1006752					
Q6						40516
Q7						
Q8						
Q9						40517
Q10	1006753					
Q11	1006752					
Q12	1006752					40518
Q13	1006753					

(-) REPLACES 1006148 AFTER SYSTEM NO. 20 WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL —
HEAT TREATMENT —
FINAL FINISH —
NEXT ASSY USED ON APPLICATION

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DRAWN D. Bonaccorso DATE 6-8-64
CHECKED C. Edmond DATE 6-8-64
APPROVAL [illegible] DATE 6-10-64
NASA APPROVAL [illegible] DATE 6-16-64
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC,
STRAND GATE MODULE B31

CODE IDENT NO. — SIZE E — NASA DRAWING NO. 1006189
SCALE — WT — SHEET 2 OF 2

A 1006268

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	JHT
A	REVISED PER TDRR 13409	10/26/64	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS SPECIFIED IN ND 1002052 WHEN TESTED IN CONJUNCTION WITH PIN CONTACT 1010738-1. SEE NOTES 2.D AND 3.B.
   - C. MARKING: PARTS AND INTERNAL AND EXTERNAL PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, DATE OF MANUFACTURE OR DATE CODE, AND THE NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). THE MANUFACTURER'S PART NUMBER MAY APPEAR ON PACKAGES.
   - D. QUALITY ASSURANCE: PER ND 1015404 CLASS 2.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. CERTIFICATION: CONFORMANCE WITH MATERIAL AND FINISH REQUIREMENT SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. DIMENSIONS: AS DELINEATED
   - C. MARKING: AS REQUIRED IN NOTE 1.C ABOVE.
   - D. ELECTRICAL CHARACTERISTICS (WHEN 1010738-1 CONTACTS ARE ASSEMBLED)
     - (1) INSULATION RESISTANCE (TEST PER MIL-STD-202, METHOD 302, CONDITION C) 2000 MEGOHMS MINIMUM AT 150°F BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.
     - (2) DIELECTRIC WITHSTANDING VOLTAGE (TEST PER MIL-STD-202, METHOD 301) SEA LEVEL - 1500 VRMS; 90,000 TO 130,000 FEET - 250 VRMS
       THERE SHALL BE NO BREAKDOWN OR FLASHOVER BETWEEN THE MOUNTING HARDWARE AND ANY CONTACT OR BETWEEN ANY TWO ADJACENT CONTACTS.
   - E. PIN IDENTIFICATION SHALL BE MARKED BY RAISED MOLDED CHARACTERS.

3. DESIGN REQUIREMENTS:
   - A. VOLTAGE DESIGN RATINGS:

ALTITUDE	VOLTS DC	VOLTS RMS (SINUSOIDAL)
SEA LEVEL	490	350
10,000 FT.	390	280
60,000 FT.	140	100

   - B. CONTACT RETENTION FORCE: 15 POUNDS MINIMUM AXIAL LOAD WITHOUT DAMAGE TO PROPERLY INSTALLED CONTACTS APPLIED IN EITHER DIRECTION. APPLY LOAD AT ONE POUND PER SECOND RATE.
   - C. MATING CONNECTOR: 1006269
   - D. CONSTRUCTION:
     - (1) MATERIAL: BODY, SPACER: DIALLYL PHTHALATE PER MIL-M-14, TYPE SDG-F (TAN COLOR)

       POLARIZING BOSS: 7075-T6 ALUMINUM ALLOY PER QQ-A-277.

       METAL INSERT: CORROSION-RESISTANT STEEL PER QQ-S-763, CLASS 303 OR 303SE, CONDITION A OR B.

       RETAINING RING: MS 16632-28
     - (2) FINISH:

       POLARIZING BOSS: GREY ANODIZE PER MIL-A-8625, CLASS 1.

       METAL INSERT: PASSIVATE PER MIL-F-14072, E300

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTE
HEAT TREATMENT
FINAL FINISH: SEE NOTE

MIT INSTRUMENTATION LAB, CAMBRIDGE MASS
DWG NO. / CONTRACT

DRAWN S.T. Collins DATE 27 MAR 64
CHECKED J.C. Jackson 27 Mar 64
APPROVAL
APPROVAL Edw. C. Hall 31 Mar 64
NASA APPROVAL W. J. Rhein 3-31-64
MIT APPROVAL
MIT APPROVAL J. Nagel 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL (244 PIN BODY)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006268

SCALE NONE WT SHEET 1 OF 2

1006268

A 1006268

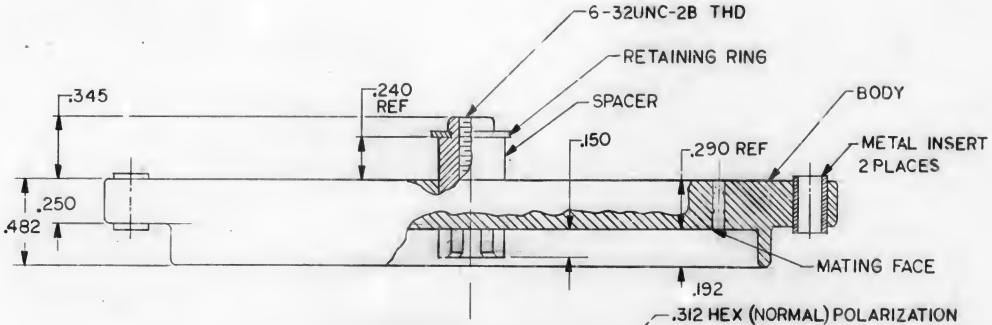
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 07334	3/31/64	DM
A	REVISED PER TDRR 13408	10/26/64	[illegible]

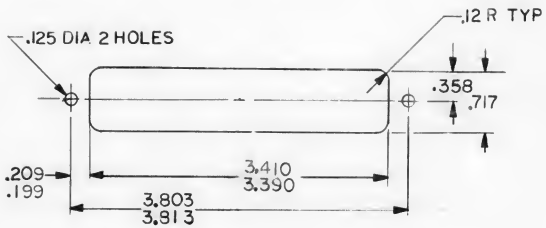
VIEWED FROM MATING FACE

NASA PART NUMBER	POLARIZING CHART
1006268-1	A, 90°, 45°N, B
1006268-2	A, 15°, 90°V, B
1006268-3	A, 90°W, 15°, B

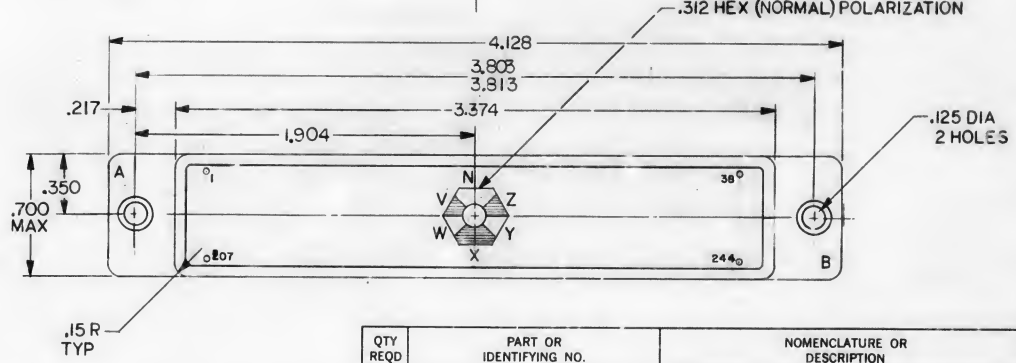
THIS LETTER FOR END IDENT. ONLY TYP

HIGH POINTS OF POLARIZING BOSS SHADED





RECOMMENDED MOUNTING HOLE CUTOUT



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ±.010 ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH SEE NOTE
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG. NO. | CONTRACT
DRAWN S. T. Dickie DATE 12 MAR 64
CHECKED [illegible] 17 Mar 64
APPROVAL
APPROVAL Alden C. Hall 31 Mar 64
NASA APPROVAL W. J. Arthur 6-31-64
MIT APPROVAL
MIT APPROVAL [illegible] 3/31/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CONNECTOR, PLUG, ELECTRICAL (244 PIN BODY)

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— | SIZE C | NASA DRAWING NO. 1006268
SCALE NONE | WT | SHEET 2 OF 2

— 1006277

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 08551	5-19-64	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THIS PRODUCT SHALL CONFORM TO THE REQUIREMENTS OF MIL-S-15192A EXCEPT AS, AND IN ADDITION TO THE REQUIREMENTS, SPECIFIED BELOW.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

   D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED EXTERNALLY AND/OR INTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, COMPOUND NUMBER, NET WEIGHT, LOT CODE OR NUMBER, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER).

2. ACCEPTANCE AND INSPECTION:

   A. APPEARANCE: THIS SILICA SHALL BE A WELL PULVERIZED WHITE POWDER.

   B. CHEMICAL COMPOSITION: 99.0% SILICA (SiO_2) MINIMUM

   C. PHYSICAL PROPERTIES (PERCENT BY WEIGHT)

      (1) IGNITION LOSS (AT 1000°C ON A MOISTURE FREE BASIS): 1.0% MAXIMUM

      (2) COARSE PARTICLES: 0.02% MAXIMUM

      (3) HYDROGEN ION CONCENTRATION (PH): 3.5 - 4.2 FOR A 4% (BY WEIGHT) AQUEOUS DISPERSION.

      (4) POUR DENSITY: 2.3 POUNDS PER CUBIC FOOT MAXIMUM (43.48 CUBIC FEET PER 100 POUNDS).

      (5) FREE MOISTURE (AT 105°C): 1.0% MAXIMUM

   D. CERTIFICATION: COMPLIANCE WITH THE PHYSICAL DESIGN REQUIREMENTS SPECIFIED BELOW SHALL BE CERTIFIED WITH EACH SHIPMENT.

3. DESIGN:

   A. PHYSICAL PROPERTIES (TYPICAL)

      (1) PARTICLE SIZE (AVERAGE): 0.015 MICRONS

      (2) MEASURED PARTICLE SURFACE AREA: 175-225 SQUARE METERS PER GRAM.

      (3) SPECIFIC GRAVITY: 2.2

      (4) REFRACTIVE INDEX: 1.46

      (5) BULKING VALUE: 5.5 GALLONS PER 100 POUNDS (.735 CUBIC FEET PER 100 POUNDS)

PROCURE ONLY FROM APPROVED SOURCES LISTED IN NL 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [signature] DATE 29 Apr 64
CHECKED [signature] DATE 5/29/64
APPROVAL
APPROVAL [signature] 15 May 64
NASA APPROVAL [signature] 5/12/64
MIT APPROVAL
MIT APPROVAL [signature] 5/11/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SILICA, PULVERIZED, PYROGENIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006277
SCALE NONE	WT	SHEET 1 OF 1

–	1829001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
–	INITIAL RELEASE CLASS A PER TDRR 11514		

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE OR CODING, EXPIRATION DATE, AND NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER).

2. ACCEPTANCE AND INSPECTION:

   A. THIS DRAWING IDENTIFIES A TWO COMPONENT POLYURETHANE PLASTIC FOAM CONSISTING OF A PLASTIC RESIN AND A CURING AGENT. THE COMPONENTS ARE SUPPLIED IN THE RATIO OF 39 PARTS RESIN AND 61 PARTS CURING AGENT BY WEIGHT.

   B. PROPERTIES (AS RECEIVED):

      (1) RESIN:

      APPEARANCE: YELLOWISH LIQUID

      (2) CURING AGENT:

      APPEARANCE: YELLOWISH LIQUID

DASH NO.	MATERIAL
-1	RESIN
-2	CURING AGENT

   C. PROPERTIES (CURED): THE TWO COMPONENTS, WHEN MIXED AND CURED (UNCONTAINED) AT ROOM TEMPERATURE FOR ONE-HALF HOUR, SHALL FORM A PLASTIC MATERIAL (CLOSED CELL FOAM) HAVING THE FOLLOWING PROPERTIES:

      (1) NOMINAL DENSITY: 6 POUNDS/CU. FT. PER ASTM D792-50.

      (2) COMPRESSIVE STRENGTH: 120 POUNDS/SQ. IN. MINIMUM PER ASTM D695-54.

      (3) TENSILE STRENGTH: 120 POUNDS/SQ. IN. MINIMUM PER ASTM D638-58T.

      (4) SHEAR STRENGTH: 100 POUNDS/SQ. IN. MINIMUM PER ASTM D732-46.

3. DESIGN:

   A. PROPERTIES (CURED): THE TWO COMPONENTS, WHEN MIXED AND CURED (UNCONTAINED) AT ROOM TEMPERATURE FOR ONE-HALF HOUR, SHALL FORM A PLASTIC MATERIAL (CLOSED CELL FOAM) HAVING THE FOLLOWING PROPERTIES:

      (1) K FACTOR: 0.25 BTU/HR/FT^2/°F/IN. MAXIMUM PER ASTM C177-45.

      (2) MAXIMUM SERVICE TEMPERATURE: 180°F.

      (3) CLOSED CELL CONTENT: 95% MINIMUM

      (4) WATER SORPTION (10 FT HEAD FOR ONE WEEK): .035 POUNDS/SQ FT.

   B. SHELF-LIFE: WHEN STORED IN CLEAN, TIGHTLY CLOSED CONTAINERS IN TEMPERATURES BETWEEN 55°F AND 75°F, THE SHELF LIFE SHALL NOT BE LESS THAN SIX (6) MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT
FINAL FINISH

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN S.T. Oglivie DATE 22 July 64
CHECKED J. M. Gilmore 2 Aug 64
APPROVAL C. Draper 11 Aug 64
APPROVAL _____
NASA APPROVAL [illegible] 8/12/64
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
———	C	1006281
SCALE NONE	WT	SHEET 1 OF 1

1006281

1006298 —

REVISIONS 13259			
SYM	DESCRIPTION	DATE	APPROVAL
-	INITIAL RELEASE CLASS A PER TDRR		

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 2.

2. INSPECTION AND ACCEPTANCE:

   A. MECHANICAL REQUIREMENTS

      (1) PAINT THICKNESS TO BE UNIFORM FROM .002 - .005 ALL SURFACES

      (2) CORES SHALL BE ADEQUATELY SEALED TO WITHSTAND THE FOLLOWING TEST:

         (a) SUBMERGE THE CORES TO A DEPTH OF TWO(2) INCHES MAXIMUM IN A MIXTURE OF 1/2 GLYCERINE AND 1/2 ETHYLENE GLYCOL. APPLY A VACUUM SUCH THAT A COLUMN OF MERCURY WOULD DROP TWENTY-FIVE(25) INCHES FROM SEA LEVEL PRESSURE FOR A PERIOD OF TWO(2) MINUTES MINIMUM.

         (b) ANY UNIT THAT EXHIBITS BUBBLES SHALL BE REJECTED.

         (c) UPON COMPLETION OF THIS TEST, THOROUGHLY WASH THE CORES IN RUNNING WATER, ALLOW TO DRY AND PERFORM A COMPLETE ELECTRICAL INSPECTION.

         (d) THE VENDOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE THAT CORES SUPPLIED HAVE PASSED THIS TEST.

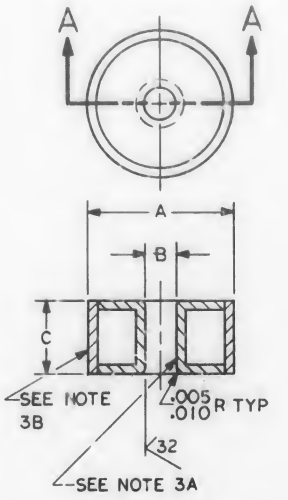
      (3) MARKING - PACKING SLIPS AND EXTERNAL OR INTERNAL CONTAINERS SHALL BE MARKED WITH THE MANUFACTURERS NAME, PART NUMBER, AND NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER.

   B. ELECTRICAL REQUIREMENTS (100%)

      (1) TESTING SHALL BE PERFORMED AS OUTLINED ON SHEET 2.
      (2) PARAMETERS SHALL BE IN ACCORDANCE WITH TABLE I.

3. DESIGN REQUIREMENTS:

   A. BOBBIN MATERIAL SHALL BE 303 SST PER QQ-S-763B, PART SHALL BE FREE FROM BURRS
   B. JACKET MATERIAL SHALL BE .001 THICK PHENOLIC SLEEVE
   C. CORES SHALL BE FABRICATED FROM 1/8 MIL MO-PERM RIBBON WOUND ON AUSTENITIC STAINLESS STEEL.



NASA DRAWING NUMBER	DIM A	DIM B	DIM C	CHARACTERISTICS
1006298-1	.249 .240	.140 MIN	.105 .090	TABLE I
1006298-2	.187 .174	.100 MIN	.065 MAX	TABLE II

TABLE I
26 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_P u SEC	T_S u SEC	V_I MV	V_O MV
200 MA / u SEC	2.5 ± 5%	1.5 MIN 2.1 MAX	235 MIN 290 MAX	—
400 MA / u SEC	1.4 MIN 1.6 MAX	1.3 MIN 1.5 MAX	325 MIN 400 MAX	—
1000 MA / u SEC	—	—	—	15 MAX

TABLE II
11 MAXWELL
CORE FUNCTIONAL CHARACTERISTICS

RAMP	T_P u SEC	T_S u SEC	V_I MV	V_O MV
200 MA / u SEC	2.2 ± 5%	1.5 MIN 2.1 MAX	100 MIN 130 MAX	—
400 MA / u SEC	1.3 ± 5%	1.0 MIN 1.4 MAX	145 MIN 190 MAX	—
1000 MA / u SEC	—	—	—	9 MAX

PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± ___ DECIMALS ± ___ ANGLES ± ___
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN B. Robinson DATE 7 Jul 64
CHECKED Neal Sturdy 12 Jul 64
APPROVAL
APPROVAL Edwin C Hall 16 Oct 64
NASA APPROVAL W J Robins 10-6-64
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006298
SCALE NONE	WT	SHEET 1 OF 3

1006298

–	8929001

REVISIONS 13259			
SYM	DESCRIPTION	DATE	APPROVAL
–	INITIAL RELEASE CLASS A PER TDRR		W/K

4. TEST REQUIREMENTS:
   INSPECTION AND/OR TEST

   A. TEST EQUIPMENT: CORES ARE TO BE TESTED IN AN EQUIPMENT WHICH PERMITS APPLICATION OF A "SET" PULSE OF SUFFICIENT AMPLITUDE AND DURATION TO SATURATE THE CORE UNDER TEST, FOLLOWED BY A LINEAR (APPROX) RAMP WHOSE SLOPE MAY BE MEASURED.

   B. CALIBRATION OF TEST EQUIPMENT: STANDARD CORES FURNISHED BY MIT ARE TO FORM THE BASIS OF THIS SPECIFICATION AND ARE TO BE USED FOR THE PURPOSE OF CALIBRATING THE TEST EQUIPMENT.

   C. CALIBRATION PROCEDURE: EQUIPMENT SHALL BE CONNECTED TO A WELL-REGULATED LINE SUPPLY AND ALLOWED TO STABILIZE FOR ONE HOUR BEFORE MEASUREMENTS ARE MADE.

      1) CALIBRATE SWEEP OF TEKTRONIX 530-340 SERIES OSCILLOSCOPE WITH TEKTRONIX TIME-MARK GENERATOR OR EQUIVALENT.

      2) USING TYPE D HIGH-GAIN DIFFERENCE AMPLIFTER PLUG-IN, CALIBRATE VERTICAL AMPLIFIER WITH A CALIBRATOR WHICH PERMITS THE APPLICATION OF A KNOWN (±1%) VOLTAGE TO THE VERTICAL AMPLIFIER. THE INTERNAL CALIBRATOR OF THE OSCILLOSCOPE MAY BE USED PROVIDING ITS ACCURACY HAS BEEN VERIFIED.

      3) ADJUST THE AMPLITUDE AND DURATION OF THE SET PULSE SO THAT THEY ARE RESPECTIVELY AT LEAST 1/2 AMPERE AND 10 uSEC.

      4) ADJUST THE SLOPE OF THE RAMP SO THAT IT INITIALLY APPROXIMATES 200 ma/uSEC. USING ONE OF THE MIT-FURNISHED STANDARD CORES, ADJUST RAMP SLOPE SO THAT MEASUREMENTS OF TIME TO PEAK, SWITCHING TIME, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORES FOR THIS PARTICULAR RAMP SLOPE.

      5) MEASURE "1" SWITCHING WAVE FORM.

      6) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 400 ma/uSEC. USING THE MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF SWITCHING TIME, TIME TO PEAK, AND AMPLITUDE CORRESPOND TO THE DATA FURNISHED WITH THE CORE FOR THIS PARTICULAR RAMP SLOPE.

      7) MEASURE "1" SWITCHING WAVE FORM V_2.

      8) READJUST RAMP SLOPE SO THAT IT APPROXIMATES 1000 ma/uSEC. DISCONNECT SET PULSE. USING MIT-STANDARD CORE, ADJUST RAMP SLOPE SO THAT THE MEASUREMENTS OF PEAK "ZERO" OUTPUT VOLTAGE IS OBTAINED. USE INTEGRATING CIRCUIT, SHOWN IN FIGURE 1, WHEN PERFORMING THIS MEASUREMENT.

      9) MEASURE "ZERO" OUTPUT V_0 ON CORES, USING INTEGRATION CIRCUIT.

      10) REPEAT CALIBRATION PROCEDURE AFTER TESTING EACH 100 CORES OR AFTER 8 OPERATION HOURS, WHICHEVER IS SOONER.

   D. DEFINITIONS:

      1) TIME TO PEAK SHALL BE MEASURED FROM THE START OF THE RAMP TO THE PEAK OF THE OUTPUT VOLTAGE WAVEFORM. THE START OF THE RAMP MAY BE FOUND BY EXTENDING THE RAMP BACK UNTIL IT CROSSES THE "ZERO CURRENT " AXIS.

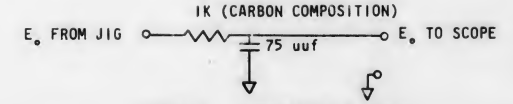


FIGURE 2. INTEGRATING CIRCUIT

THE VOLTAGE INDUCED BY THE TESTING JIG MUST BE TAKEN INTO ACCOUNT WHEN MEASURING V_0. A TYPICAL CASE IS SHOWN IN FIGURE 3. PEAK V_0 IS DEFINED AS THE MAXIMUM OF $V_{"ZERO"} - V_{JIG}$.

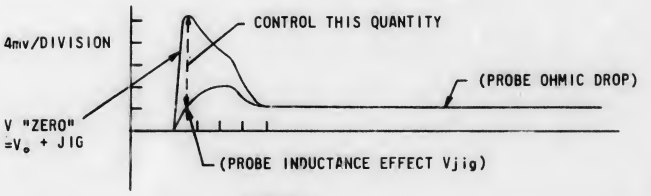


FIGURE 3

TYPICAL OUTPUT VOLTAGES, AFTER INTEGRATION, DUE TO JIG INDUCTANCE AND RESISTANCE; COMBINED JIG AND "ZERO" OUTPUTS: CURRENT SLOPE = 1000 mA/uSEC.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± ___ DECIMALS ± ___ ANGLES ±___
		DO NOT SCALE THIS DRAWING
		MATERIAL
		HEAT TREATMENT
		FINAL FINISH
NEXT ASSY	USED ON	
APPLICATION		

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R. Kane DATE 5 Sept 63
CHECKED [illegible] 5 Sept 63
APPROVAL
APPROVAL Edwin C Hall 6 Oct 64

NASA APPROVAL W J Rhine 10-6-64
MIT APPROVAL [signature] 10/6/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006298

SCALE NONE | WT | SHEET 2 OF 3

1006298

–	1006298

REVISIONS			3259
SYM	DESCRIPTION	DATE	APPROVAL
–	INITIAL RELEASE CLASS A PER TDRR		

DEFINITIONS: (CONT.)

2) SWITCHING TIME SHALL BE MEASURED FROM 10% OF THE OUTPUT WAVEFORM TO 10% OF SAME WAVEFORM.

3) PEAK AMPLITUDE SHALL BE MEASURED FROM ZERO VOLTS TO THE PEAK OF THE OUTPUT WAVEFORM.

4) FOR MEASUREMENTS OF "ZERO" OUTPUT, THE INTEGRATING CIRCUIT SHOWN BELOW SHALL BE USED.

E. LIMITS - (SEE FIGURE 1)

1) TIME TO PEAK (T_p) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±5% OF THE STANDARD CORE OUTPUT FOR BOTH RAMP SLOPES.

2) SWITCHING TIME (T_s) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

3) PEAK "ONE" OUTPUT (V_1) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±10% OF THE STANDARD CORE FOR BOTH RAMP SLOPES.

4) PEAK "ZERO" OUTPUT (V_0) SHALL BE THE SAME AS THE NOMINAL CORE TO WITHIN ±20%.

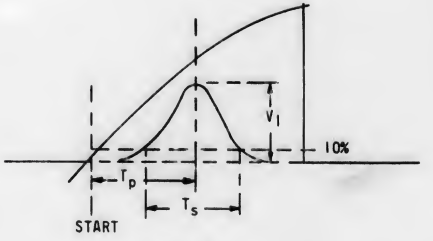


FIGURE 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. — CONTRACT

DRAWN R. Kane DATE 5 Sept 65
CHECKED [illegible] 5 Sept 65
APPROVAL
APPROVAL Eldon C Hall 6 Oct 65

NASA APPROVAL W J Rubin 10-6-65
MIT APPROVAL [illegible] 6 Oct 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CORE, MAGNETIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006298
SCALE NONE	WT	SHEET 3 OF 3

1006298

— 1006303

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 15507	1-13-65	WK.

REQUIREMENTS:

1. GENERAL:

A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

B. THE VARNISH SPECIFIED HEREIN SHALL BE A CELLULOSIC LACQUER WHICH CONFORMS TO THE REQUIREMENTS OF MIL-I-17384A, TYPE G, AND AS SPECIFIED BELOW.

C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

D. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED INTERNALLY AND/OR EXTERNALLY, IN ACCORDANCE WITH MIL-STD-129, WITH THE MANUFACTURER'S NAME, PRODUCT IDENTITY, NAS1 DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, LOT OR SERIAL NUMBER AND DATE OF MANUFACTURE OR CODING. FLAMMABILITY AND TOXICITY WARNINGS SHALL BE MARKED.

E. PACKAGING AND PACKING: UNIT PACKAGING SHALL BE IN ACCORDANCE WITH THE SUPPLIER'S NORMAL COMMERCIAL PRACTICE. SHIPPING CONTAINERS SHALL BE OF THE TYPE, SIZE AND KIND COMMONLY USED FOR THE PURPOSE IN A MANNER THAT WILL INSURE ACCEPTANCE BY COMMON CARRIER AND SAFE DELIVERY AT DESTINATION. SHIPPING CONTAINERS SHALL COMPLY WITH THE UNIFORM FREIGHT CLASSIFICATION RULES OR REGULATIONS OF OTHER CARRIERS, AS APPLICABLE TO THE MODE OF TRANSPORTATION.

2. ACCEPTANCE AND INSPECTION:

A. PHYSICAL PROPERTIES:

(1) COLOR: CLEAR COLORLESS

(2) SPECIFIC GRAVITY (60°/60°F): 22°-24° API GRAVITY (.91-.92 G /CC) ASTM D287-55.

(3) VISCOSITY (AT 77°F): 12-20 SECONDS FOR GARDNER-HOLDT BUBBLE TUBE PER FED-STD-141, METHOD 4271. (700 TO 1350 CPS)

(4) AIR DRYING TIME: 15 MINUTES MAXIMUM.

(5) FLASH POINT: 60°F MINIMUM.

B. ELECTRICAL CHARACTERISTICS:

(1) DIELECTRIC STRENGTH (DRY): 1500 VOLTS/MIL (60 CPS RMS PER ASTM D115-55)

(2) INSULATION RESISTANCE: 100 MEGOHMS MINIMUM

3. DESIGN:

A. ELECTRICAL RATINGS:

(1) DIELECTRIC STRENGTH (AFTER 24 HOUR IMMERSION): 800 VOLTS/MIL (60 CPS RMS PER ASTM D115-55)

B. CHEMICAL RESISTANCE: ACID, WATER, AND OILPROOF.

C. STORAGE LIFE: ONE YEAR MINIMUM WHEN STORED IN TIGHTLY CLOSED ORIGINAL CONTAINERS AT TEMPERATURES BELOW 80°F.

D. VISCOSITY ADJUSTMENT: THIS LACQUER MAY BE THINNED USING TOLUENE OR OTHER SUITABLE CELLULOSIC LACQUER SOLVENTS.

E. MATERIALS COMPATIBILITY: ONLY THESE MATERIALS/COMPOSITIONS/COMPOSITES FOUND TO BE NONTOXIC AND NONCOMBUSTABLE WHEN TESTED PER ND1002251 AND ND1002252 SHALL BE APPROVED.

F. FUNGUS RESISTANCE: MATERIALS SHALL NOT SUPPORT FUNGUS WHEN TESTED PER ND1002253.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

ARE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN D Haney 5 NOV 64
CHECKED R.T. Desmarais 5 NOV 64
APPROVAL C.M. Jarrard 3 Dec '64
APPROVAL
APPROVAL Eldon C. Hall 11 Jan 65
NASA APPROVAL W J Rhine 1-13-65
MIT APPROVAL
MIT APPROVAL W Hopper 13 Jan 65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INSULATING VARNISH, ELECTRICAL, QUICK DRYING

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006303
SCALE NONE	WT	SHEET 1 OF 1

— 1006386

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24071			11-4-65	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002056, INCLUDING THOSE SPECIFIED FOR NON-HERMETICALLY SEALED UNITS.
   - D. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER ND 1002019, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, PLUS THE NASA PART NUMBER (DRAWING NUMBER) AND REVISION LETTER . SERIALIZE UNITS PER ND 1002023.
   - E. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) DIMENSIONS: SHALL BE AS SHOWN.
     - (2) LEAD MATERIAL: SHALL BE A SOLDERABLE MATERIAL, TIN PLATED PER MIL-T-10727 TYPE 1, THICKNESS 0.0001 MINIMUM , 0.00025 MAX. PRESERVATIVE COATING IS REQUIRED, BUT SALT SPRAY TESTS AND PERFORMANCE OF QUALITY ASSURANCE PROVISIONS PER MIL-T-10727 ARE NOT REQUIRED.
     - (3) UNITS SHALL BE TESTED FOR LEAKS BY IMMERSION IN WATER UNDER REDUCED PRESSURE. (METHOD 512 OF MIL-STD-810).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: INITIAL 14 FOOT LAMBERTS AVERAGE MINIMUM WHEN EXCITED BY 250 VRMS ± 1% AT 800 ± 10 CPS SINE WAVE WITH NO DISPLAY LESS THAN 12 FOOT LAMBERTS
     - (2) POWER FACTOR: 0.35 MAXIMUM WHEN EXCITED PER 2.B.(1)
     - (3) TOTAL CURRENT (ALL AREAS ENERGIZED PER 2.B.(1): 3.75 MA
     - (4) CASE TO ALL PIN RESISTANCE: 10 MEGOHM MINIMUM

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 35% OF ORIGINAL LIGHT OUTPUT INTENSITY WHEN EXCITED PER 2.B.(1) AT 25°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM WITHOUT LOSS OF ELECTRICAL PERFORMANCE AT 0°C TO +94°C.
   - C. OPERATING TEMPERATURE RANGE: -55°C TO +94°C.
   - D. UNITS SHALL BE HERMETICALLY SEALED AND CAPABLE OF OPERATING UNDER A REDUCED PRESSURE EQUIVALENT TO 100,000 ALTITUDE.
   - E. PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
   - F. PEAK TRANSIENT VOLTAGE: 500 VOLTS MAXIMUM NOT TO EXCEED ONE HALF CYCLE AT THE OPERATING FREQUENCY.
   - G. LIGHT OUTPUT FREQUENCY: 5100 ANGSTROMS (NOMINAL).
   - H. LEAD STRENGTH: LEAD SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

4. BURN-IN (VENDOR): UNITS WHICH MEET INITIAL ELECTRICAL REQUIREMENTS SHALL BE OPERATED FOR 100 HOURS, EXCITED PER 2.B.(1); AFTER BURN-IN UNIT SHALL MEET INITIAL ELECTRICAL CHARACTERISTICS, EXCEPT THAT BRIGHTNESS SHALL BE NOT LESS THAN 9.5 FOOT LAMBERTS. BEFORE-AND-AFTER BURN-IN READINGS OF BRIGHTNESS, CURRENT, AND POWER FACTOR SHALL ACCOMPANY UNITS.

TABLE I	
PIN NO.	CONNECTS TO
1	AREA A
2 & 4	AREA B
3	AREA C
G1, G2	COMMON GRD RETURN

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING

MATERIAL

SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN		4 NOV 65
CHECKED		9 NOV 65
APPROVED		
APPROVED		16 Nov 65
APPROVED MIT	A. C. METZGER	16 Nov 65
APPROVED MSC		DATE

INDICATOR, ALARM, ELECTROLUMINESCENT

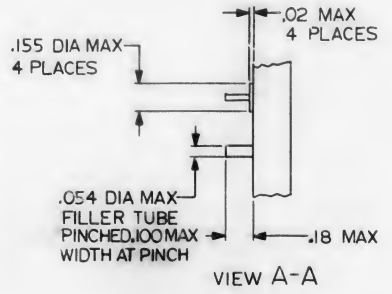
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006386

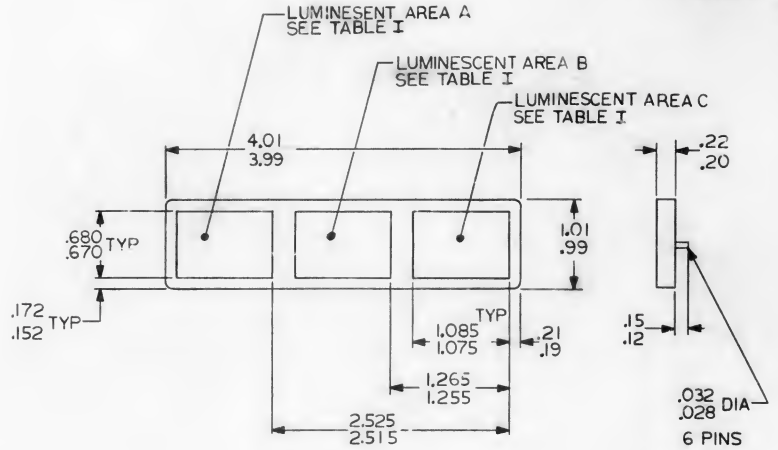
SCALE NONE — SHEET 1 OF 2

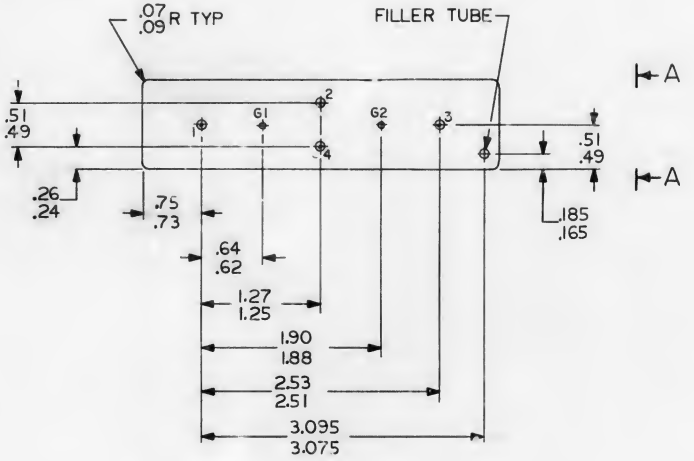
— 1006386

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
—		INITIAL RELEASE CLASS A PER TDRR 24071			11-16-65	



VIEW A-A





QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
			LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL

SEE NOTE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN Jim Dias 9/16/65
CHECKED D Tang 9/16/65
APPROVED
APPROVED Ellen Hall 16 Nov 65
APPROVED MIT W Kuyper 16 Nov 65
A. L. METZGER
APPROVED MSC
DATE

INDICATOR, ALARM, ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006386

SCALE NONE SHEET 2 OF 2

1006393 A

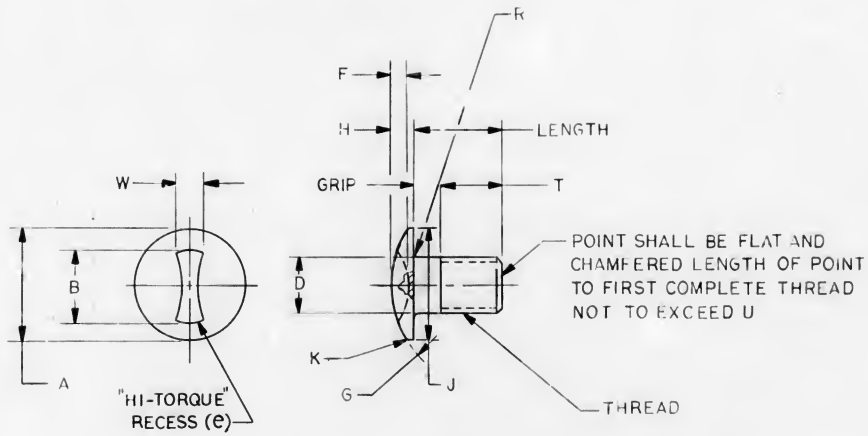
REVISIONS							
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED	
–		INITIAL RELEASE PER TDRR 27098			15-66		
A		① REVISED PER TDRR 3/823	JRK	PBR	7 Nov 66		

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. PREPARATION FOR DELIVERY: IN ACCORDANCE WITH ND 1002215, CLASS I, CODE 3.
     - (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND 1002215.

2. ACCEPTANCE AND INSPECTION: SAMPLE
   - A. MARKING: AS SPECIFIED IN NOTE 1.C. ABOVE.
   - B. DIMENSIONS AND TOLERANCES: AS SPECIFIED.
   - C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.
     - (1) CERTIFICATE OF COMPLIANCE WITH DESIGN REQUIREMENTS.

3. DESIGN:
   - A. MATERIAL AND FINISH: CORROSION AND HEAT RESISTANT STEEL PER AMS 5735 ALLOY A-286, PASSIVATED PER MIL-S-5002.



DASH NUMBER	THREAD	A DIA	B REF	D DIA	F	G RAD REF	H	J DIA MIN	R RAD	T (REF)	U	W REF	K	GRIP	LENGTH	MS33750 RECESS NUMBER (e)
-001	4-40 UNC-3A	.219 .205	.208	.1115 .1095	.047 .043	.300	.063 .059	.195	.010 .005	.175	.050	.084	.028 .020	.075±.020	.250±.031	#1
-002	8-32NC 3A	.312 .298	.260	.164 .1585	.061 .055	.440	.087 .083	.289	.015 .010	.295	.062	.090	.060 .050	.080 MAX.	.375±.015	#2

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN Kal Simpson 22FEB 1966
CHECKED Bob Marsh 23 FEB 1966
APPROVED
APPROVED Elden C. Hall 4 Mar 66
APPROVED/MIT W. Cryder 15 Mar 66
APPROVED/MSC A. L. Metzger DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, PAN HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006393

SCALE NONE SHEET 1 OF 1

1006393 A

A 1006396

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		INITIAL RELEASE CLASS A PER TDRR 28747			5-11-66	
	A	REVISED PER TDRR 30655	JJB	RLW	21 SEP 66	
	B	REVISED PER TDRR 33643	JJB	RLW	26 APR 67	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: UNIT PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME, LOT OR SERIAL NUMBER, PART NUMBER, NET CONTENTS, DATE OF MANUFACTURE, EXPIRATION DATE AND NASA PART NUMBER (DRAWING NUMBER AND DASH NUMBER) AND REVISION SYMBOL.

   D. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S BEST COMMERCIAL PRACTICE.

   E. CURING AGENT AND RESIN SHALL BE SHIPPED IN SCREW TOP CANS.

   B. SHELF LIFE: THE RESIN AND CURING AGENT SHALL BE CAPABLE OF BEING STORED IN TIGHTLY CLOSED CONTAINERS AT TEMPERATURES NOT TO EXCEED 100°F FOR NOT LESS THAN THREE (3) MONTHS FROM THE DATE OF SHIPMENT.

PRECAUTION: AFTER CONTAINERS ARE OPENED USE PROMPTLY AS PROPERTIES ARE LIMITED.

DASH NO.	MATERIAL
-001	RESIN
-002	CURING AGENT

2. ACCEPTANCE AND INSPECTION: SAMPLE

   A. THIS DRAWING IDENTIFIES A TWO COMPONENT PLASTIC FOAM MATERIAL CONSISTING OF A POLYURETHANE RESIN AND A CURING AGENT.

   B. PROPERTIES (AS RECEIVED):
      (1) RESIN:
         (a) APPEARANCE: AMBER LIQUID
      (2) CURING AGENT:
         (a) APPEARANCE: YELLOW LIQUID

   C. PROPERTIES (CURED): WHEN MIXED IN THE RATIO BY WEIGHT OF 10 TO 9, RESIN TO CURING AGENT, AND THE MIXTURE CURED FOR 1/2 HOUR MINIMUM AT 81°F ± 6°F A PLASTIC FOAM MATERIAL SHALL BE FORMED HAVING THE FOLLOWING PROPERTIES:
      (1) DENSITY: 5 TO 6 POUNDS/CU FT PER ND1002295, TEST METHOD B.
      (2) COMPRESSIVE STRENGTH: 130 POUNDS/SQ IN. MINIMUM PER ASTM D695-54 (AT 5% DEFLECTION).
      (3) RISE HEIGHT: 1.25 TO 0.80 PER ND 1002295, TEST METHOD A.

3. DESIGN:

   A. PROPERTIES (CURED): WHEN MIXED AND CURED AS SPECIFIED ABOVE MATERIAL SHALL HAVE THE FOLLOWING PROPERTIES:
      (1) WATER ABSORPTION: 3.0% AFTER ONE WEEK AT 100% RELATIVE HUMIDITY.
      (2) MAXIMUM SERVICE TEMPERATURE: 160°F
      (3) TENSILE STRENGTH: 225 POUNDS/SQ IN. MINIMUM PER ASTM D638-58T.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN K. Simpson 19 MAR 1966
CHECKED J. Hennessey 23 MAR 1966
APPROVED
APPROVED Edwin A. Hall 11 May 66
APPROVED MIT A. C. METZGER 5-11-66
APPROVED MSC DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESIN, URETHANE FOAM

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1006396

SCALE NONE SHEET 1 OF 1

1006396 B

0179001

REVISIONS 02821			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: PACKAGING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT OR SERIAL NUMBER, NASA DRAWING NUMBER, REVISION LETTER AND QUANTITY ENCLOSED IN EACH CONTAINER.

2. ACCEPTANCE AND INSPECTION:

   A. MECHANICAL PROPERTIES:

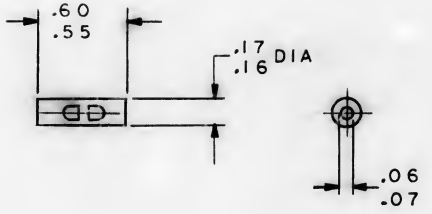
      (1) DIMENSIONS: SEE SKETCH.

   B. ELECTRICAL CHARACTERISTICS:

      (1) SHALL BE CAPABLE OF CARRYING THE MAXIMUM CURRENT FOR A #14 WIRE - 11 AMPERES.

3. DESIGN:

   A. MATERIAL: COPPER PER QQ-C-576, TIN PLATED PER MIL-T-10727A. A CERTIFICATE OF COMPLIANCE WITH MATERIAL SPECIFICATION SHALL BE INCLUDED WITH EACH SHIPMENT.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN MD 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTES**
HEAT TREATMENT
FINAL FINISH

INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN J.D.H. Ramsey DATE 7 Aug 63
CHECKED J. Rizzo for M. Maynard 7 Aug 63
APPROVAL E. Brandt 23 Aug 63
APPROVAL Edwin C. Hall 23 Aug 63
NASA APPROVAL Jack Bannon
MIT APPROVAL L. Wolfe 8/21/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPLICE, CONDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006710

SCALE NONE | WT | SHEET 1 OF 1

Ⓜ A 1006730

REVISIONS TDRR 03511			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 04398	4/4/63	PAR WK

REQUIREMENTS:

1. GENERAL:

   A. DRAWING SHALL BE IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: PACKAGING OF PARTS SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, THE SUPPLIERS NAME, LOT NUMBER, DATE OF MANUFACTURE AND NUMBER OF UNITS CONTAINED IN EACH PACKAGE.

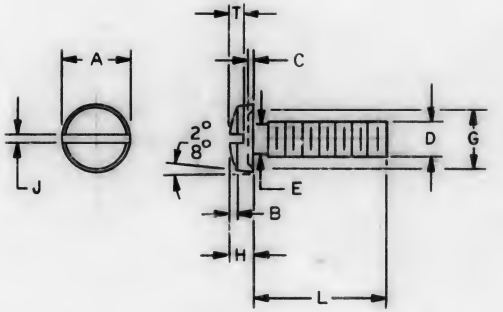
2. ACCEPTANCE AND INSPECTION:

   A. DIMENSIONS: AS SPECIFIED HEREIN.

   B. MATERIAL: BRASS PER QQ-B-613 OR QQ-W-321, NICKEL PLATED PER QQ-N-290. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPPED.

3. DESIGN:

   A. THE THREADS SHALL BE IN ACCORDANCE WITH SCREW-THREAD STANDARDS FOR FEDERAL SERVICES HANDBOOK H-28.



A	A
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R.W. Hooker DATE 19 Sept 63
CHECKED J. Ruggiero Mfg Engrg 23 Sept 63
APPROVAL
APPROVAL Edwin C Hall 10 Oct 63
NASA APPROVAL Jack R. Brainard
MIT APPROVAL W. Hayes 10 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006730
SCALE NONE	WT	SHEET 1 OF 2

1006730 A

A 1006730

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 04398	11/12/63	EAK WR

NOMINAL SIZE	D		2 (.086)	4 (.112)	6(.138)	8 (.164)	10 (.190)	1/4	5/16	3/8	10(.190)
THREADS PER INCH			56NC	40NC	32NC	32NC	24NC	20UNC	18UNC	16UNC	32UNC
HEIGHT OF OVAL	B	MAX	.018	.025	.032	.039	.045	.061	.077	.094	.045
		MIN	.013	.018	.024	.029	.034	.046	.059	.071	.034
DIAMETER OF UNDERCUT	G	MAX	.141	.184	.226	.269	.312	.410	.513	.615	.312
		MIN	.124	.161	.199	.236	.274	.360	.450	.540	.274
BODY DIAMETER	E	MAX	.0860	.1120	.1380	.1640	.1900	.2500	.3125	.3750	.1900
		MIN	.0717	.0925	.1141	.1399	.1586	.2127	.2712	.3287	.1586
HEAD DIAMETER	A	MAX	.181	.235	.290	.344	.399	.513	.641	.769	.399
		MIN	.171	.223	.275	.326	.378	.488	.609	.731	.378
HEAD HEIGHT	H	MAX	.050	.068	.087	.105	.123	.165	.209	.253	.123
		MIN	.041	.056	.071	.087	.102	.138	.174	.211	.102
SLOT WIDTH	J	MAX	.031	.039	.048	.054	.060	.075	.084	.094	.060
		MIN	.023	.031	.039	.045	.050	.064	.072	.081	.050
SLOT DEPTH	T	MAX	.030	.042	.053	.065	.077	.109	.134	.163	.077
		MIN	.024	.034	.044	.054	.064	.088	.112	.136	.064
DEPTH OF UNDERCUT	C	MAX	.010	.012	.015	.017	.020	.026	.032	.039	.020
		MIN	.005	.007	.010	.012	.015	.021	.027	.034	.015

LENGTH	L	TOLERANCE	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.	DASH NO.
THREADS SHALL EXTEND TO WITHIN 2 THREADS OF THE BEARING SURFACE OF THE HEAD, OR CLOSER IF PRACTICABLE.	1/8		1	11	24	39					
	3/16		2	12	25	40	58				120
	1/4		3	13	26	41	59				121
	5/16		4	14	27	42	60	76			122
	3/8	+0	5	15	28	43	61	77	92		123
	7/16	-1/32	6	16	29	44	62	78	93		124
	1/2		7	17	30	45	63	79	94	107	125
	5/8		8	18	31	46	64	80	95	108	126
	3/4		9	19	32	47	65	81	96	109	127
	7/8		10	20	33	48	66	82	97	110	128
	1			21	34	49	67	83	98	111	129
	1-1/4	+0		22	35	50	68	84	99	112	130
	1-1/2	-1/16		23	36	51	69	85	100	113	131
	1-3/4				37	52	70	86	101	114	132
	2				38	53	71	87	102	115	133
MINIMUM COMPLETE THREAD LENGTH OF 1-3/4.	2-1/4					54	72	88	103	116	134
	2-1/2	+0				55	73	89	104	117	135
	2-3/4	-3/32				56	74	90	105	118	136
	3					57	75	91	106	119	137

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG NO CONTRACT

DRAWN Rodules DATE 19 Sep 63
CHECKED J. Ruggiero 03 Oct 63
APPROVAL W. Hoppes
APPROVAL Ellen C Hall 1 Oct 63

NASA APPROVAL Jack Bannon
MIT APPROVAL W. Hoppes 1 Oct 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, MACHINE, SLOTTED HEAD

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006730
SCALE NONE	WT	SHEET 2 OF 2

1006730

1006736

REVISIONS 04617			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 04617	13 NOV 63	GW.

NOTES:

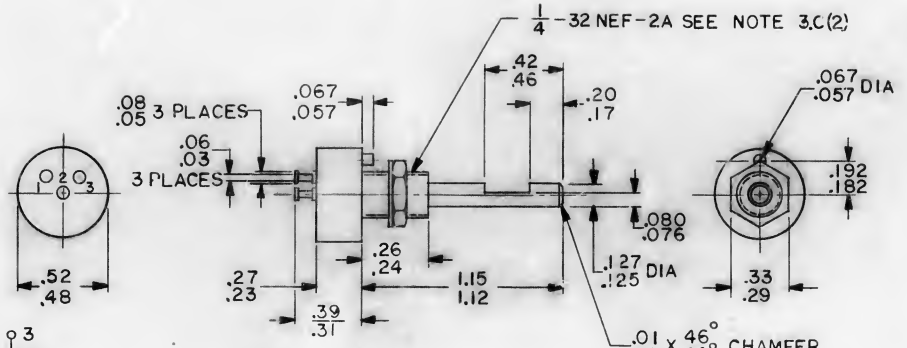
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE APPLICABLE GENERAL REQUIREMENTS OF MIL-R-27208A AND MIL-R-19A WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED BELOW.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002049.
   - E. MARKING: UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE NASA PART NUMBER (DRAWING NUMBER, REVISION LETTER, AND DASH NUMBER IF APPLICABLE). PACKAGES SHALL BE MARKED PER MIL-STD-129, WITH THE MANUFACTURER S NAME AND/OR SYMBOL, LOT CODE, DATE OF MANUFACTURE OR DATE CODE, RESISTANCE VALUE AND POWER RATING, PLUS THE NASA PART NUMBER.

2. ACCEPTANCE AND INSPECTION REQUIREMENTS (100%)
   - A. MECHANICAL REQUIREMENTS:
     - (1) SHAFT TORQUE (OPERATING): BETWEEN 3 AND 10 OUNCE-INCHES.
     - (2) STOP TORQUE: 2 POUND-INCHES MINIMUM.
     - (3) MECHANICAL TRAVEL: 300° ± 5°.
   - B. ELECTRICAL CHARACTERISTICS (AT 25°C AND 50% RH)
     - (1) RESISTANCE VALUE AND TOLERANCE: 10 K ± 5%.
     - (2) ELECTRICAL TRAVEL: 300° ± 5° WITH 2% MAXIMUM END RESISTANCE.
     - (3) DIELECTRIC WITHSTANDING VOLTAGE: 900 VRMS AT SEA LEVEL AND 450 VRMS AT 50,000 FEET (3.4 INCHES MERCURY).
     - (4) INSULATION RESISTANCE: 1000 MEGOHMS AT 100 ± 10 VRMS.

3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM AT .30 WATT DISSIPATION AND +125°C.
   - B. STORAGE LIFE: 1 YEAR MINIMUM AT STANDARD ROOM TEMPERATURE AND HUMIDITY.
   - C. CONSTRUCTION: UNITS SHALL BE HERMETICALLY SEALED, IMMERSION PROOF PER MIL-R-27208, AND EXPLOSION PROOF PER MIL-STD-202 METHOD 109.
     - (1) MATERIAL: CASE AND SHAFT, NICKEL-PLATED BRASS. TERMINALS, GOLD-FLASHED BRASS.
     - (2) HARDWARE: MOUNTING NUT AND LOCKWASHER FURNISHED.
   - D. RATING: 2 WATT AT +85°C DERATED LINEARLY TO ZERO AT +150°C.
   - E. INDEPENDENT LINEARITY: ± 3%.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING (NON-OPERATING): UNITS SHALL BE TEMPERATURE CYCLED A TOTAL OF THREE (3) CYCLES. EACH CYCLE SHALL CONSIST OF INCREASING THE TEMPERATURE FROM 25°C TO 125°C, THEN DECREASING TO -55°C, THEN RETURNING TO 25°C. READINGS TO BE TAKEN AT ALL TEMPERATURE EXTREMES. A RESISTANCE CHANGE GREATER THAN 2.0% FROM THE ORIGINAL READING SHALL BE CONSIDERED A FAILURE. CYCLING SHOULD BE DONE IN ACCORDANCE WITH MIL-STD-202, METHOD 102.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



SCHEMATIC

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH SEE NOTES

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. — CONTRACT
DRAWN [signature] DATE 31 OCT 63
CHECKED J. Riggen
APPROVAL
APPROVAL Eldon C Hall 13 NOV 63
NASA APPROVAL [signature] 13 Nov 63
MIT APPROVAL [signature] 13 Nov 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RESISTOR, VARIABLE, WW

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006736

SCALE NONE | WT | SHEET 1 OF 1

B 1006738

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—	INITIAL RELEASE CLASS A PER TDRR 05197	12/17/63	[illegible]
A	REVISED PER TDRR 12803	9/29/64	[illegible]
B	REVISED PER TDRR 14740	12/15/67	[illegible]

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743 EXCEPT AS AND IN ADDITION TO REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNIT SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNIT SHALL BE MARKED PER ND 1002019 , WITH TERMINAL IDENTIFICATION AND NASA PART NUMBER. (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED, PER MIL-STD-129, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE, PART NUMBER AND NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE 52 ALLOY, GOLD PLATED. CERTIFICATE OF MATERIAL COMPLIANCE FROM THE SUPPLIER SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 12 TO 18 OUNCES.
   - E. MARKING: PER PARAGRAPH 1.E.
   - F. PRETRAVEL: 1/8 ± 1/32.
   - G. TOTAL TRAVEL: .240 MIN.
   - H. TOTAL ACTUAL TRAVEL SHALL BE LIMITED ONLY BECAUSE OF RETAINING SPRING CLIP INTERFERENCE AGAINST BUSHING SHOULDER. ANY UNIT WHOSE TOTAL TRAVEL DOES NOT SEAT SPRING CLIP AGAINST BUSHING SHALL BE REJECTED.
3. DESIGN:
   - A. OPERATING TEMPERATURE RANGE: -80°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
       RESISTIVE: 5 AMPERES
       INDUCTIVE: 3 AMPERES
     - (3) INRUSH CURRENT: 3 AMPERES PER MOTOR LOAD REQUIREMENT OF MIL-S-6743
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUND AXIAL COMPRESSIVE FORCE.
   - E. STRENGTH OF TERMINALS: 5 POUND AXIAL TENSILE FORCE.
   - F. CONTACT VOLTAGE DROP: 100 MILLIVOLTS MAXIMUM WHEN 1 AMPERE IS APPLIED THROUGH CONTACTS, AFTER COMPLETION OF RUN-IN PER PARAGRAPH 4.A.
   - G. SEAL LEAK RATE: SHALL BE HERMETICALLY SEALED. LEAK RATE NOT MORE THAN 10^{-6} ATM/CC/MIN.
   - H. CONTACT BOUNCE: NOT MORE THAN 2.0 MILLISECONDS TOTAL; INDIVIDUAL BOUNCES NOT MORE THAN 0.6 MILLISECONDS THERE SHALL BE NO BOUNCE LARGE ENOUGH TO CAUSE MOVABLE CONTACT TO CLOSE WITH NC CONTACT.
   - J. UNITS SHALL MEET THE SHOCK, VIBRATION, AND EXPLOSION-PROOF REQUIREMENTS OF ND 1002055.
4. SPECIAL CONDITIONING: (BY SUPPLIER)
   - A. RUN-IN: UNITS SHALL BE OPERATED FOR 1000 CYCLES WITH ½ CONTACT CURRENT OF 1 AMPERE AND AN OPEN CIRCUIT VOLTAGE OF 28 VDC.
5. VENDOR SUPPLIED DATA:
   - A. CERTIFICATE OF ANALYSIS FOR LEAD MATERIAL
   - B. CERTIFICATE OF COMPLIANCE TO ND1015404, CLASS 2
   - C. BEFORE AND AFTER RUN-IN READING FOR
     (1.) CONTACT RESISTANCE (3) TOTAL TRAVEL
     (2.) PRETRAVEL (4) ACTUATING FORCE

.153 / .159 DIA X .19 MIN DEPTH

.115 / .130

90°

VIEW A-A

INSERT RETAINING SPRING CLIP .032 NOM THK TO RETAIN SHAFT AS SHOWN IN DETAIL C AGAINST PULL OUT FORCE OF 7 LB MIN

.128 / .121 .151 .130 .032

DETAIL C

.435 / .425 ACROSS FLATS X .094 / .084 THK HEX NUT

KEYWAY (SEE DETAIL B)

$\frac{3}{8}$-32UNEF-2A THD.

.505 / .495 DIA X .027 / .017 THK INTERNAL TOOTH LOCKWASHER

.505 / .495 DIA X .036 / .026 THK KEYWASHER .098 / .088 WIDE TAB

.055 / .045 DIA LEAD TYP 3 PLACES

.41 MAX

.516 / .484 DIA

.26 / .24 .31 MAX .255 / .245 .063 / .070 .621 / .591 .05 REF 1.13 MAX 10203 .07 MIN .515 / .485 .799 / .779

A A

.046 REF .031 REF .187 MIN

DETAIL B

3 N.C.

1 C

2 N.O.

SYMBOL

NORMALLY CLOSED

NORMALLY OPEN

COMMON

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH: SEE NOTES

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO / CONTRACT
DRAWN [illegible] DATE 19 NOV 63
CHECKED [illegible]
APPROVAL
APPROVAL Ellen C Hall 16 Dec 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, PUSH
HERMETIC SEAL

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006738

SCALE NONE WT SHEET 1 OF 1

∆ 1006752

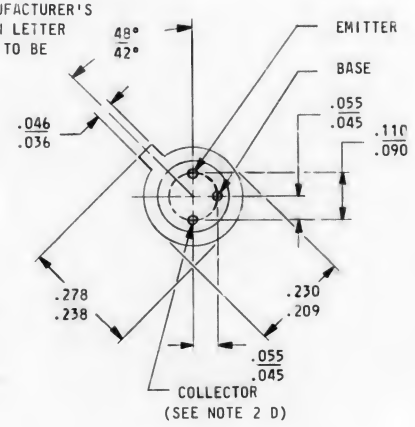
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR00398		

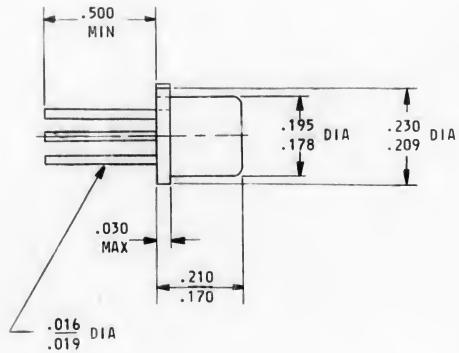
NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT +25°C AMBIENT.
     - (1) COLLECTOR TO EMITTER VOLTAGE (VCEO): 15 VOLTS DC
     - (2) COLLECTOR TO BASE VOLTAGE (VCBO): 40 VOLTS DC
     - (3) EMITTER TO BASE VOLTAGE (VEBO): 5 VOLTS DC
     - (4) COLLECTOR CURRENT (IC): 300 MILLIAMPERES
     - (5) POWER DISSIPATION: 1.2 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION - CASE, (θ_{JC}): 145° C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION - AMBIENT, (θ_{JA}): 480° C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER AND THE NUMBER 752. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.





ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT NO 302034

A	A	A	A
–	–		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
	REVISION STATUS OF SHEETS		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	LIST OF MATERIALS		

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN A. Marais DATE 1-25-63
CHECKED H. Hayward 1-25-63
APPROVAL G. Blomberg 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-17-63
MIT APPROVAL W. Kuyken 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006752
SCALE NONE	WT	SHEET 1 OF 4

1006752

1006752 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00338	2-19-63	WK

NOTES (CONTINUED):

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHOD: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS.		
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)		
POWER, BURN-IN	METHOD 1026 P = 327 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS		
SEAL TEST	SEE NOTE 3 D (3)		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG. NO. CONTRACT
DRAWN A. Marts DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL [signature] 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-17-63
MIT APPROVAL [signature] 13 Feb 63

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HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE; NPN LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006752
SCALE	WT	SHEET 2 OF 4

1006752 B

1006752 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00398	2-13-63	

TABLE II

ACCEPTANCE INSPECTION

TEST	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS MAX	UNIT	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V; I_E = 0		25	nA	100%	LTPD* = 2 (COMBINED) MAX ACC NO = 3
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V; I_E = 0, T_A = +150°C		15	uA		
COLLECTOR BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 10 uA; I_E = 0	40		Vdc		
EMITTER BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 10 uA; I_C = 0	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	$V_{CEO(SUST)}$	I_C = 10 mA (PULSED)	15		Vdc		
EMITTER BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 4 V; I_C = 0		0.1	uA		
COLLECTOR-EMITTER CURRENT RESISTANCE RETURN	I_{CER}	V_{CE} = 30 V; R_{BE} = 100 K		1.0	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} = 0.45 V; V_{CE} = 20 V		1	uA		
DC CURRENT GAIN	h_{FE}	I_C = 100 mA; V_{CE} = 1 V	20		-		
DC CURRENT GAIN	h_{FE}	I_C = 10 mA; V_{CE} = 1 V	30	90	-		
DC CURRENT GAIN	h_{FE}	I_C = 1 mA; V_{CE} = 1 V	20		-		
BASE EMITTER SATURATION VOLTAGE	$V_{BE(SAT)}$	I_C = 10 mA; I_B = 1 mA	0.70	0.80	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(SAT)}$	I_C = 10 mA; I_B = 1 mA		0.25	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(SAT)}$	I_C = 100 mA; I_B = 10 mA		.70	Vdc		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = 10 V; I_E = 0; f = 140 kc SEE NOTE 3 D (4)		6	pf		
TURNOFF TIME	T_{off}	I_{B1} = 3 mA; I_{B2} = 1 mA V_{CC} = 3 V; R_L = 270 Ω tw ≥ 400 nSEC; 2% DUTY CYCLE		75	nSEC		
CHARGE STORAGE TIME CONSTANT	T_s	I_{B1} = I_{B2} = I_C = 10 mA R_L = 1000; V_{CC} = 10 VDC		25	nSEC		
TURN ON TIME	T_{on}	I_{B1} = 3 mA; V_{BE} = -2 V V_{CC} = 3 V; R_L = 270 Ω tw ≤ 400 nSEC; 2% DUTY CYCLE		40	nSEC		

* LTPD PER MIL-S-19500C, TABLE IV

REVISION A THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO | CONTRACT

DRAWN A. Mantz DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL G. Mayo 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL W. Sapp 2/13/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN LOGIC

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006752
SCALE | WT | SHEET 3 OF 4

1006752 A

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00398	2-13-63	

TABLE III

QUALITY DEMONSTRATION TESTS			
TEST	TEST CONDITION	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2** THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SEAL TEST	SEE NOTE 3 D (3)		
SUBGROUP 3** STORAGE LIFE	METHOD 1031 Tstg = 200° ± 5°C, 1000 HOURS		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC, 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G		
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 327 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A =+22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		$\lambda^{\bullet}$ = 10 MAX ACC NO.= 3
SUBGROUP 5** LEAD TENSION	SEE NOTE 3 D (2)		LTPD = 20 (COMBINED) MAX ACC NO.= 3
LEAD FATIGUE	SEE NOTE 3 D (1)		

• PER MIL-S-19500C TABLE IV

•• TESTS TO BE PERFORMED IN SEQUENCE INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V, I_E = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} = 1 V, I_C = 10 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 20 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} = 1 V, I_C = 10 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

REVISION A THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO CONTRACT

DRAWN G. Marks DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL [illegible] 2-13-63
APPROVAL
NASA APPROVAL W. J. Kehrer 2-13-63
MIT APPROVAL W. Kupfer 13 Feb 63

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HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN LOGIC
SPECIFICATION CONTROL DRAWING

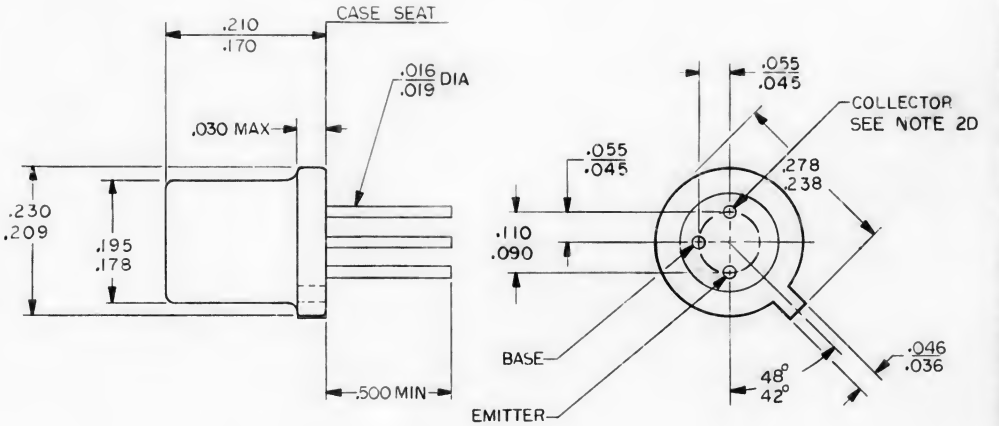
CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006752
SCALE	WT	SHEET 4 OF 4

B 1006753

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00339	2-13-63	WK

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 15 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 20 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 4 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 500 MILLIAMPERES
     - (5) POWER DISSIPATION: 1.0 WATT AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 175°C/WATT
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 585°C/WATT
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX)
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 753. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.



2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, PNP.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-18).
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.
3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

B	B	B	B
A	A	—	—
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO. CONTROL:
DRAWN A. Matz DATE 1-25-63
CHECKED H. Maynard 1-25-63
APPROVAL S. Hwang 2-13-63
APPROVAL
NASA APPROVAL W. O. Rhine 2-13-63
MIT APPROVAL W. Griffin B. Felker

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006753
SCALE NONE	WT	SHEET 1 OF 4

1006753 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00399	2-13-63	RS WK

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT, WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1×10^{-8} CC/ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT	
		1 TO 500	OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72^{+8}_{-4} HOURS.		
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)		
POWER, BURN-IN	METHOD 1026 P = 270 MILLIWATTS V_{CE} = -11.0 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR $t = 168^{+12}_{-6}$ HOURS		
SEAL TEST	SEE NOTE 3 D (3)		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	MIT INSTRUMENTATION LAB CAMBRIDGE, MASS. DWG NO / CONTRACT
		DO NOT SCALE THIS DRAWING	DRAWN A. Matt DATE 1-25-63
		MATERIAL SEE NOTES	CHECKED H. Maynard 1-25-63
		HEAT TREATMENT NONE	APPROVAL D. Shapiro 2-13-63
NEXT ASSY	USED ON	FINAL FINISH NONE	APPROVAL
APPLICATION			NASA APPROVAL W. J. Rhine 2-13-63
			MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006753
SCALE	WT	SHEET 2 OF 4

1006753 B

1006753 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00399	2-13-63	

TABLE II

TEST	SYMBOL	TEST CONDITIONS	LIMIT MIN	LIMIT MAX	UNITS	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO=3	LTPD* = 10 MAX ACC NO=3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} =-15 V; I_E = 0		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO. = 3
COLLECTOR CUTOFF CURRENT 150°C	I_{CBO}	V_{CB} =-15 V; I_E = 0		15	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C =-10 uA; I_E = 0	20		V		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} =-3 V; I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E =-10 uA; I_C = 0	4		V		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	V_{CEO} SUST	I_C =-10 mA PULSED I_B = 0					
COLLECTOR-EMITTER CURRENT RES.RETURN	I_{CER}	V_{CE} =-20 V; R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CURRENT	I_{CEX}	V_{BE} =-0.45; V_{CE} = -15 V		1	uA		
DC CURRENT GAIN	h_{FE}	I_C =-100 mA; V_{CE} =-1 V	15				
DC CURRENT GAIN	hFE	I_C =-10 mA; V_{CE} =-1 V	30	90			
DC CURRENT GAIN	hFE	I_C =-1 mA; V_{CE} =-1 V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE} SAT	I_C =-10 mA; I_B =-1 mA	0.7	0.9	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(sat)}$	I_C =-10 mA; I_B =-1 mA		0.25	V		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE(sat)}$	I_C =-100 mA; I_B =-10 mA		0.7	V		
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} =-10 V; I_E=0; F=.14 mc SEE NOTE 3 D (4)		10	PF		
TURN ON TIME	t_{on}	I_{B1} =-1 mA; I_{B2} =-1 mA V_{CC} =-3 V; R_L = 300 Ω $t_w \geq$ 400 nsec 2% DUTY CYCLE		120	NSEC		
TURN OFF TIME	t_{off}	I_{B1} =-1 mA; I_{B2} =-1 mA V_{CC} =-3 V; R_L = 300 Ω $t_w \geq$ 400 nsec 2% DUTY CYCLE		300	NSEC		

* LTPD PER MIL-S-19500C, TABLE IV

REVISION B THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO / CONTRACT

DRAWN A. Marks DATE 1-25-63
CHECKED W. Maynard 1-25-63
APPROVAL H. Hoag 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL W. Kaplan 2-13-63

MANNED SPACECRAFT CENTER
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TRANSISTOR, SILICON, TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006753
SCALE	WT	SHEET 3 OF 4

1006753 B

1006753 B

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00399	2-13-63	

TABLE III

QUALITY DEMONSTRATION TESTS			
TEST	TEST CONDITION	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2 ** THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SEAL TEST	SEE NOTE 3 D (3)		
SUBGROUP 3 ** STORAGE LIFE	METHOD 1031 Tstg = 300° ± 5°C, 1000 HOURS		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SHOCK	METHOD 2016, 1500 G, 0.5 MSEC 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL		
VIBRATION VARIABLE FREQUENCY	METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM.		
CONSTANT ACCELERATION	METHOD 2006, 20,000 G		
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 270 MILLIWATTS V_{CE} = 11 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		$\bar{\lambda}$ = 10 MAX ACC NO.= 3
SUBGROUP 5 ** LEAD TENSION	SEE NOTE 3 D (2)		LTPD = 20 (COMBINED) MAX ACC NO.= 3
LEAD FATIGUE	SEE NOTE 3 D (1)		

* PER MIL-S-19500C TABLE IV

** TESTS TO BE PERFORMED IN ORDER INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} =-15 V, I_C = 0	±50% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} =-3 V, I_C = 0	±50% *
DC CURRENT GAIN	hFE	V_{CE} =-1 V, I_C =-10 mA	±10% *
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} =-15 V, I_E = 0	±100% *
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} =-3 V, I_C = 0	±100% *
DC CURRENT GAIN	hFE	V_{CE} =-1 V, I_C =-10 mA	±20% *

* THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE

REVISION B THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO — CONTRACT
DRAWN A. Mata DATE 1-25-63
CHECKED
APPROVAL 2-13-63
APPROVAL
NASA APPROVAL 2-13-63
MIT APPROVAL 13 Feb 1963

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE PNP LOGIC
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006753
SCALE | WT | SHEET 4 OF 4

1006753 B

C 1006759

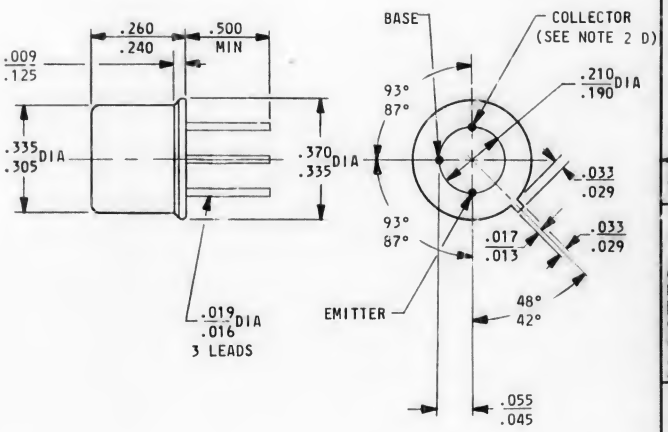
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 0988	2-13-63	WJC

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE
     - (5) POWER DISSIPATION: 2.5 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



C	C	C	C
B	B		
A	A		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
OWG. NO CONTRACT
DRAWN A. Marks DATE 11-26-63
CHECKED W. Hayward 11-26-63
APPROVAL Charles Boyo 2-13-63
APPROVAL
NASA APPROVAL W. J. Whitsett 2-13-63
MIT APPROVAL W. Cuffer 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 1 OF 4

1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00400	2-12-63	

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8}/CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT NO 1015404, CLASS 1.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING

TEST	TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)		
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS		
SEAL TEST	SEE NOTE 3 D (3)		

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAE, CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN A. Marsh DATE 11-7-63
CHECKED D. Maynard 11-7-63
APPROVAL [illegible] 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL [illegible] 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, MEDIUM POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006759

SCALE NONE | WT | SHEET 2 OF 4

1006759

C 1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00600	2-13-63	KS WK

TABLE II

ACCEPTANCE INSPECTION							
TEST	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS MAX	UNIT	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50, I_E = 0		25	mμA	100%	LTPD* = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150 C	I_{CBO}	V_{CB} = 50, I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 100 uA, I_E = 0	60		Vdc		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 100 uA, I_C = 0	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	$V_{CEO\ SUST}$	I_C = 10 mA PULSED I_B = 0	30		Vdc		
COLLECTOR-EMITTER CURRENT RES RET	I_{CER}	V_{CE} = 40 V, R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CUR	I_{CEX}	V_{BE} = 0.45 V, V_{CE} = 50 V		1	uA		
DC CURRENT GAIN	h_{FE}	I_C = 500 mA, V_{CE} = 10 V	25				
DC CURRENT GAIN	h_{FE}	I_C = 100 mA, V_{CE} = 10 V	40	120			
DC CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 10 V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE}	I_C = 500 mA, I_B = 50 mA	1.1	1.3	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE\ SAT}$	I_C = 500 mA, I_B = 50 mA		1.0			
FORWARD CURRENT TRANSFER RATIO	h_{fe}	V_{CE} = 10 V, I_C = 50 mA f = 20 MC	3				
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = 10 V, I_E = 0 SEE NOTE 3 D (4), f =140kc		20	pf		

* LTPD PER MIL-S-19500, TABLE IV

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE MASS
D 3 NO | CONTRACT
DRAWN A Morello DATE 11 Feb 63
CHECKED W Raymond 11 Feb 63
APPROVAL K Kroy 2-13-63
APPROVAL
NASA APPROVAL W J Rhine 2-13-63
MIT APPROVAL W Tyler 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN; MEDIUM POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 3 OF 4

1006759

C 1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00402	2-13-63	

TABLE III

QUALITY DEMONSTRATION TESTS			
TEST	TEST CONDITION	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1 PHYSICAL DIMENSIONS	METHOD 2066	NO REQUIREMENTS	LTPD = 20 MAX ACC NO.= 1
SUBGROUP 2 ** THERMAL SHOCK SEAL TEST	METHOD 1056, CONDITION B (+200°C TO -65°C, 5 CYCLES) SEE NOTE 3 D (3)		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 3 ** STORAGE LIFE SHOCK VIBRATION VARIABLE FREQUENCY CONSTANT ACCELERATION	METHOD 1031 Tstg = 200° ± 5°C, 1000 HOURS METHOD 2016, 1500 G, 0.5 MSEC, 5 BLOWS EACH IN X1, Y1, Y2, Z1 DIRECTIONS, 20 BLOWS TOTAL METHOD 2056, 30 G FROM 5 TO 2000 CPS LIMITED TO 0.12 DOUBLE AMPLITUDE, 3 CYCLES, 15 MINUTES PER CYCLE MINIMUM. METHOD 2006, 20,000 G		LTPD = 10 (COMBINED) MAX ACC NO.= 3
SUBGROUP 4 OPERATION LIFE	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 1000 HOURS		$\lambda^{\bullet}$ = 10 MAX ACC NO.= 3
SUBGROUP 5 ** LEAD TENSION LEAD FATIGUE	SEE NOTE 3 D (2) SEE NOTE 3 D (1)		LTPD = 20 (COMBINED) MAX ACC NO.= 3

• λ PER MIL-S-19500C TABLE IV

•• TESTS TO BE PERFORMED IN SEQUENCE INDICATED

TABLE III (CONTINUED)

TEST	SYMBOL	TEST CONDITION	LIMIT
END POINTS FOR SUBGROUP 2			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50 V, I_E = 0	±50% •
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±50% •
DC CURRENT GAIN	hFE	V_{CE} = 10 V, I_C = 100 mA	±10% •
END POINTS FOR SUBGROUPS 3 AND 4			
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50 V, I_E = 0	±100% •
EMITTER CUTOFF CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0	±100% •
DC CURRENT GAIN	hFE	V_{CE} = 10 V, I_C = 100 mA	±20% •

• THE PARAMETER MEASURED MAY NOT CHANGE ANY GREATER THAN THE PERCENTAGE SPECIFIED BETWEEN THE INITIAL VALUE AND THE END OF TEST VALUE. VALUES OF COLLECTOR AND EMITTER CUTOFF CURRENTS LESS THAN 5 MILLIMICROAMPERES MAY BE CONSIDERED TO BE 5 MILLIMICROAMPERES FOR CALCULATING PERCENTAGE CHANGE.

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG NO / CONTRACT
DRAWN A. Monte DATE 10 Dec 62
CHECKED V. Maynard 14 Dec 62
APPROVAL Eldon Hoyt 2-13-63
APPROVAL

NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN; MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 4 OF 4

1006759 ICA

D 1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00788	7-8-63	
D	REVISED PER TDRR 02810	9/28/63	

NOTES:

1. GENERAL REQUIREMENTS:

   A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.

   B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
      (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.
      (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.
      (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.
      (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE
      (5) POWER DISSIPATION: 2.5 WATTS AT +25°C CASE TEMPERATURE.
      (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.
      (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.

   C. TEMPERATURE:
      (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
      (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
      (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).

   D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:

   A. SEMICONDUCTOR: SILICON, NPN.

   B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.

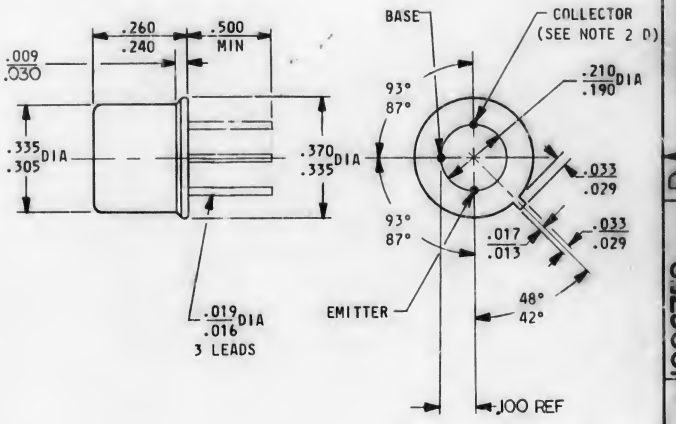
   C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.

   D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:

   A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.

   B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



D C	D C	D C	C C
B	B		
A	A		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Marks DATE 11/4/63
CHECKED J. Raymond 11/5/63
APPROVAL Gerhard 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhein 2-13-63
MIT APPROVAL W. Kuffer 13 Feb

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 1 OF 4

1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 02800	2-13-63	
D	REVISED PER TDRR 02810	8/28/63	

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8}/CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS, CHIPS OR BUBBLES.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Mantt DATE 1/7/63
CHECKED D. Maynard 1/7/63
APPROVAL [illegible] 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL [illegible] 2/13/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1006759
SCALE NONE | WT | SHEET 2 OF 4

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED & REDRAWN - THIS SHEET ADDED PER TDRR 00400	2-13-63	WJR WJR
D	REVISED PER TDRR 02810	8/28/63	DD

TABLE II

TEST	SYMBOL	TEST CONDITIONS	LIMITS MIN	LIMITS MAX	UNIT	LOT 1 TO 500	LOT OVER 500
SUBGROUP 1							
VISUAL AND MECHANICAL EXAMINATION		METHOD 2071 (SEE NOTE 3 D (5))				LTPD* = 10 MAX ACC NO = 3	LTPD* = 10 MAX ACC NO = 3
SUBGROUP 2							
COLLECTOR CUTOFF CURRENT	I_{CBO}	V_{CB} = 50, I_E = 0		25	muA	100%	LTPD* = 2 (COMBINED) MAX ACC NO.= 3
COLLECTOR CUTOFF CURRENT 150 C	I_{CBO}	V_{CB} = 50, I_E = 0		10	uA		
COLLECTOR-BASE BREAKDOWN VOLTAGE	BV_{CBO}	I_C = 100 uA, I_E = 0	60		Vdc		
EMITTER-BASE REVERSE CURRENT	I_{EBO}	V_{EB} = 4 V, I_C = 0		0.1	uA		
EMITTER-BASE BREAKDOWN VOLTAGE	BV_{EBO}	I_E = 100 uA, I_C = 0	5		Vdc		
COLLECTOR-EMITTER SUSTAINING VOLTAGE	$V_{CEO\ SUST}$	I_C = 10 mA PULSED I_B = 0	30		Vdc		
COLLECTOR-EMITTER CURRENT RES RET	I_{CER}	V_{CE} = 40 V, R_{BE} = 100 K		10	uA		
COLLECTOR-EMITTER THRESHOLD CUR	I_{CEX}	V_{BE} = 0.45 V, V_{CE} = 50 V		15	uA		
DC CURRENT GAIN	h_{FE}	I_C = 500 mA, V_{CE} = 10 V	25				
DC CURRENT GAIN	h_{FE}	I_C = 100 mA, V_{CE} = 10 V	40	120			
DC CURRENT GAIN	h_{FE}	I_C = 1 mA, V_{CE} = 10 V	20				
BASE-EMITTER SATURATION VOLTAGE	V_{BE}	I_C = 500 mA, I_B = 50 mA	1.1	1.3	Vdc		
COLLECTOR-EMITTER SATURATION VOLTAGE	$V_{CE\ SAT}$	I_C = 500 mA, I_B = 50 mA		1.0			
FORWARD CURRENT TRANSFER RATIO	h_{fe}	V_{CE} = 10 V, I_C = 50 mA f = 20 MC	3				
COLLECTOR CAPACITANCE	C_{ob}	V_{CB} = 10 V, I_E = 0 SEE NOTE 3 D (4), f = 140kc		20	pf		

* LTPD PER MIL-S-19500, TABLE IV

REVISION C THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A Monte DATE 11-14-62
CHECKED W Maynard Feb 63
APPROVAL Gilmore 2-13-63
APPROVAL
NASA APPROVAL WJ Rhine 2-13-63
MIT APPROVAL WKeffer 2/13/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN; MEDIUM POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 3 OF 4

E 1006759

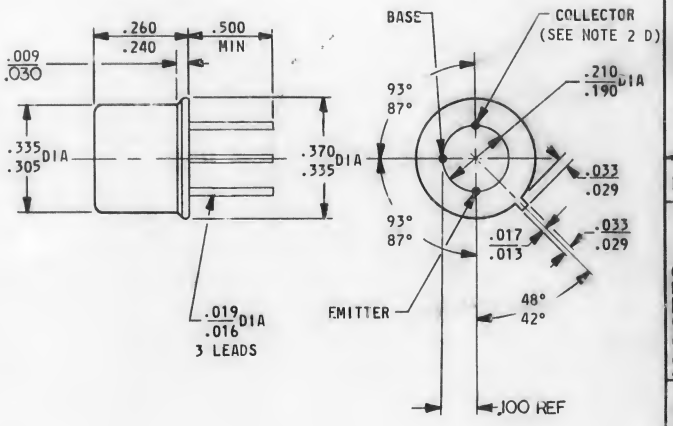
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00700	2-13-63	[illegible]
D	REVISED PER TDRR 02810	5/28/63	[illegible]
E	REVISED PER TDRR 04911	12/10/63	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:
   - A. UNIT SHALL BE IN ACCORDANCE WITH MIL-S-19500 IN ADDITION TO THE REQUIREMENTS HEREIN.
   - B. ABSOLUTE MAXIMUM RATINGS AT 25°C AMBIENT:
     - (1) COLLECTOR TO EMITTER VOLTAGE (V_{CEO}): 30 VOLTS DC.
     - (2) COLLECTOR TO BASE VOLTAGE (V_{CBO}): 60 VOLTS DC.
     - (3) EMITTER TO BASE VOLTAGE (V_{EBO}): 5 VOLTS DC.
     - (4) COLLECTOR CURRENT (I_C): 0.8 AMPERE
     - (5) POWER DISSIPATION: 2.5 WATTS AT +25°C CASE TEMPERATURE.
     - (6) THERMAL RESISTANCE, JUNCTION-CASE (θ_{JC}): 80°C/WATT.
     - (7) THERMAL RESISTANCE, JUNCTION-AMBIENT (θ_{JA}): 219°C/WATT.
   - C. TEMPERATURE:
     - (1) TEMPERATURE RANGE, JUNCTION, OPERATING: -65°C TO +200°C.
     - (2) TEMPERATURE RANGE, JUNCTION, STORAGE: -65°C TO +200°C.
     - (3) TEMPERATURE, SOLDERING LEADS: +300°C (1 MINUTE MAX).
   - D. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH STANDARD MIL-STD-130 WITH THE MANUFACTURER'S IDENTIFICATION, TYPE NUMBER, AND THE NUMBER 759. THE NASA DRAWING NUMBER AND REVISION LETTER SHALL BE MARKED ON EACH INTERIOR AND EXTERIOR SHIPPING CONTAINER AS WELL AS ON A TAG TO BE INCLUDED IN EACH SHIPPING CONTAINER.

2. CONSTRUCTION REQUIREMENTS:
   - A. SEMICONDUCTOR: SILICON, NPN.
   - B. ENCLOSURE: METAL CASE WITH GLASS HEADER, HERMETICALLY SEALED PER JEDEC (TO-5) OUTLINE.
   - C. LEADS: LEAD MATERIAL SHALL BE IN ACCORDANCE WITH NASA DOCUMENT PS 1015402. A CERTIFICATE OF COMPLIANCE FOR LEAD MATERIAL SHALL ACCOMPANY EACH LOT SHIPPED.
   - D. COLLECTOR SHALL BE ELECTRICALLY CONNECTED TO THE CASE INTERNALLY.

3. QUALITY ASSURANCE REQUIREMENTS:
   - A. LOT: A LOT IS DEFINED AS A GROUP OF PARTS IN A SINGLE PROCUREMENT SELECTED FROM A SINGLE CONTINUOUS PRODUCTION RUN USING LIKE MATERIALS WHICH ARE CONTROLLED USING A PROCESS WHICH IS THE SAME FROM THE BEGINNING TO THE END OF THE RUN.
   - B. INSPECTION CONDITIONS: UNLESS OTHERWISE SPECIFIED HEREIN ALL INSPECTIONS SHALL BE MADE AT AN AMBIENT TEMPERATURE OF PLUS 25 PLUS OR MINUS 3 DEGREES CENTIGRADE.



E	E	D	C
D	D	D	C
C	C	C	C
B	B		
A	A		
SHEET 1	SHEET 2	SHEET 3	SHEET 4
REVISION STATUS OF SHEETS			

ORIGINAL SOURCE OF SUPPLY:

PER THE QUALIFICATION STATUS LIST
NASA DOCUMENT ND 1002034

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Marks DATE 11/4/63
CHECKED [illegible] 11/4/63
APPROVAL [illegible] 2-13-63
APPROVAL

NASA APPROVAL W. J. Rhine 12-17-63
MIT APPROVAL W. Griffin 13 Dec 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006759
SCALE NONE	WT	SHEET 1 OF 4

E 1006759

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REVISED, REDRAWN, ADDED SHEETS 3 & 4 UPGRADED TO CLASS A RELEASE PER TDRR 00200	2-19-63	WL
D	REVISED PER TDRR 02810	8/28/63	WL
E	REVISED PER TDRR 04911	12/10/63	WL

NOTES: (CONTINUED)

3. C. ACCEPTANCE INSPECTION: PER TESTS IN TABLES I, II AND III AS INDICATED BELOW.

(1) THE PRE-ELECTRICAL TEST PROCESSING DEFINED IN TABLE I SHALL BE PERFORMED IN THE SEQUENCE INDICATED BEFORE THE TESTS OF TABLE II ON ALL LOTS NUMBERING LESS THAN 501 UNITS.

(2) UNITS USED IN QUALITY DEMONSTRATION TESTS OF TABLE III WILL NOT BE SHIPPED AS PART OF THE DELIVERY SCHEDULE BUT WILL BE FORWARDED ALONG WITH TEST DATA UNDER SEPARATE COVER, TO THE PURCHASER, ATTENTION: RELIABILITY MANAGER.

(3) UNITS USED IN TABLE III, SUBGROUPS 1 AND 5 MAY BE ELECTRICAL REJECTS FROM THE SAME LOT.

(4) ACCEPTABLE UNITS USED IN TESTING SUBGROUP 2 OF TABLE II SHALL BE USED IN SUBGROUPS 2, 3 AND 4 OF TABLE III.

D. TEST METHODS: (REF. MIL-STD-750 WITH EXCEPTIONS NOTED BELOW).

(1) LEAD FATIGUE : LEADS SHALL BE CAPABLE OF WITHSTANDING THE FOLLOWING LEAD BEND TEST. THE UNIT SHALL BE HELD IN A VERTICAL POSITION WITH A ONE POUND WEIGHT SUSPENDED FROM THE LEAD TO BE TESTED. TWO CYCLES OF BENDING SHALL BE PERFORMED, A CYCLE CONSISTING OF MOVING THE BODY OF THE UNIT, 90 DEGREES FROM THE VERTICAL IN ONE DIRECTION, THEN 180 DEGREES IN THE OPPOSITE DIRECTION IN THE SAME PLANE AND BACK 90 DEGREES TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(2) LEAD TENSION : EACH LEAD SHALL BE CAPABLE OF WITHSTANDING AN AXIAL PULL OF 4 POUNDS MINIMUM FOR 30 SECONDS. NO MECHANICAL DAMAGE SHALL BE EVIDENCED AFTER THE TEST.

(3) SEAL TEST: THE UNITS SHALL BE SUBJECTED TO A HELIUM OR RADIFLO LEAK DETECTION TEST WITH A SENSITIVITY OF AT LEAST 1 X 10^{-8}/CC ATM/SEC. A LEAKAGE RATE OF THIS VALUE OR GREATER SHALL CONSTITUTE A FAILURE.

(4) CAPACITANCE: MEASUREMENT OF THIS CHARACTERISTIC SHALL BE MADE USING A BOONTON ELECTRONIC CORPORATION MODEL NO. 75A-S8 CAPACITANCE BRIDGE OR EQUIVALENT.

(5) VISUAL AND MECHANICAL EXAMINATION: MARKING SHALL BE LEGIBLE, THE CASE FINISH SHALL HAVE NO PITS, FLAKING OR CHIPPING, LEADS SHALL BE FREE FROM KINKS AND NICKS AND COMPLY WITH THE SPECIFIED LEAD MATERIAL REQUIREMENT. GLASS IN HEADER SHALL HAVE NO CRACKS OR CHIPS. THERE SHALL BE NO BUBBLES IN HEADER GLASS IN CONTACT WITH HEADER FLANGE OR TERMINAL LEADS; NO BUBBLES GREATER THAN .015 INCH IN DIAMETER.

E. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT ND 1015404, CLASS 2.

4. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

TABLE I

PRE-ELECTRICAL TEST PROCESSING			
TEST	TEST CONDITIONS	LOT 1 TO 500	LOT OVER 500
THERMAL SHOCK	METHOD 1056, CONDITION B (+200°C TO -65°C, 3 CYCLES)	100%	NO REQUIREMENT
STORAGE LIFE	METHOD 1031, Tstg = 300° ± 5°C, 72 $^{+8}_{-4}$ HOURS.	↓	↓
CONSTANT ACCELERATION	METHOD 2006 (20,000 G)	↓	↓
POWER, BURN-IN	METHOD 1026 P = 0.72 WATTS V_{CE} = 22.5 VOLTS MINIMUM T_A = +22°C MIN IN FREE AMBIENT AIR t = 168 $^{+12}_{-6}$ HOURS	↓	↓
SEAL TEST	SEE NOTE 3 D (3)	↓	↓

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN A. Marsh DATE 1/7/63
CHECKED D. Maynard 1/7/63
APPROVAL C. Hurley 2-13-63
APPROVAL
NASA APPROVAL W. J. Rhine 2-13-63
MIT APPROVAL W. Hyde 13 Feb 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, SILICON, TYPE NPN, MEDIUM POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006759
SCALE NONE	WT	SHEET 2 OF 4

1006759 E

E 1006762

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
C	REPLACES REV B WITH CHANGE PER TDRR 01558	12 June 63	BJSB
D	REVISED PER TDRR 05628	11 Nov 63	DAE
E	REVISED PER TDRR 08239	14 May 64	WH

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - C. UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - D. UNITS SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-T-21038, GRADE 7, CLASS R, LIFE EXPECTANCY X WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
2. INSPECTION AND ACCEPTANCE: (100% UNLESS OTHERWISE SPECIFIED)
   - A. MECHANICAL REQUIREMENTS:
     - (1) LEADS SHALL BE IN ACCORDANCE WITH ND 1015400. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
     - (2) MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME OR SYMBOL, PART NUMBER, DASH NO., LEAD IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.
   - B. ELECTRICAL REQUIREMENTS: APPLICABLE PARAMETERS SHALL BE MEASURED USING A BOONTON 260A Q-METER OR EQUIVALENT.
     - (1) PRIMARY INDUCTANCE (L_P): 3 MH ± 20%, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (2) LEAKAGE INDUCTANCE (L_L) 5 UH MAXIMUM, MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 SHORT CIRCUITED.
     - (3) COUPLING CAPACITANCE (C_C): 50 UUF MAXIMUM, MEASURED BY SHORTING TERMINALS 1-2 AND TERMINALS 3-4 AND MEASURING THE CAPACITANCE BETWEEN THEM.
     - (4) INPUT CAPACITANCE (C_i): 30 UUF MAXIMUM MEASURED AT TERMINALS 1-2 WITH TERMINALS 3-4 OPEN.
     - (5) WORKING VOLTAGE: 50 VOLTS MINIMUM AT 105°C.
     - (6) DC RESISTANCE:
       - (a) TERMINALS 1-2: 4 OHMS MAXIMUM.
       - (b) TERMINALS 3-4: 7 OHMS MAXIMUM.
     - (7) TURNS RATIO: 1 TO 2.
     - (8) WAVEFORM: FIGURE 1 WILL REPLACE THE TEST CIRCUIT, FIGURE 4 OF MIL-T-21038B. THE INPUT PULSE TRAIN SHALL HAVE A PULSE REPETITION RATE OF 100K CPS ± 10% AND THE PULSE WIDTH SHALL BE 3.0 MICROSECONDS MINIMUM. PULSE DEFINITION AND MEASUREMENTS SHALL BE IN ACCORDANCE WITH PARAGRAPHS 3.12 AND 4.8.8 RESPECTIVELY OF MIL-T-21038B. THE TRANSFORMER OUTPUT SHALL MEET THE FOLLOWING SPECIFICATIONS MEASURED AT STANDARD CONDITIONS EXCEPT AS OTHERWISE SPECIFIED: THIS TEST SHALL BE PERFORMED ON A 5% SAMPLE OF EACH SHIPMENT WITH NO FAILURES ALLOWED.
       - (a) PULSE DURATION: 3 MICROSECONDS MINIMUM.
       - (b) PEAK PULSE AMPLITUDE: 6.0 VOLTS MINIMUM.
       - (c) DROOP: 15% MAX MEASURED AT 3 MICROSECONDS, 20°C NOM
         15% MAX MEASURED AT 2 MICROSECONDS, 105°C
       - (d) PULSE RISE TIME: 0.1 MICROSECOND MAXIMUM.
       - (e) PULSE DECAY TIME: 0.1 MICROSECOND MAXIMUM.
       - (f) OVERSHOOT N/A
       - (g) BACKSWING: 40% MAXIMUM
     - (9) DIELECTRIC WITHSTANDING VOLTAGE AT ATMOSPHERE PRESSURE (AT 28 TO 32 INCHES OF MERCURY): IN ACCORDANCE WITH PARAGRAPH 4.8.4.1 OF MIL-T-21038B. TEST BETWEEN PIN 1 AND PIN 3.
3. DESIGN REQUIREMENTS:
   - A. POWER RATING: 0.3 WATT AT 25°C DERATED LINEARLY TO .05 WATT AT 105°C.
   - B. DIELECTRIC WITHSTANDING VOLTAGE AT REDUCE BAROMETRIC PRESSURE: IN ACCORDANCE WITH PARAGRAPH 4.8.4.2 OF MIL-T-21038B. TEST CONDITION E IN METHOD 105 OF MIL-STD-202 SHALL APPLY.
   - C. UNITS SHALL BE ENCAPSULATED.
   - D. WIRE SIZE: AWG 41 OR LARGER.
   - E. OPERATING TEMPERATURE RANGE: 20°C TO 105°C.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

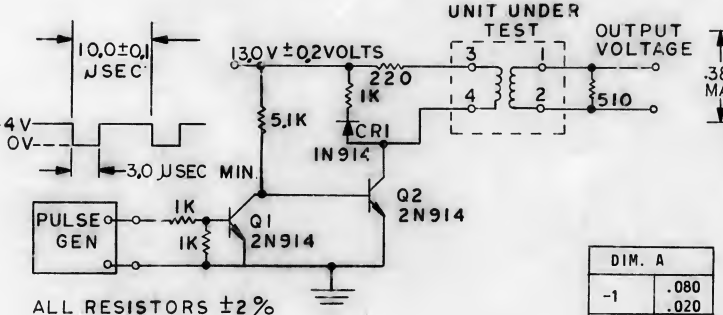
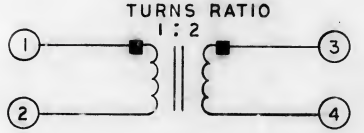
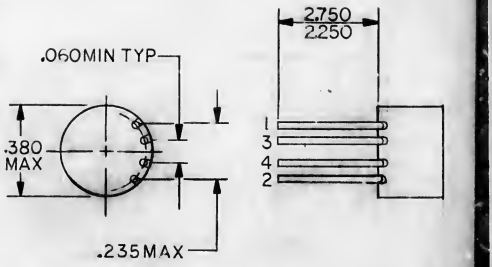
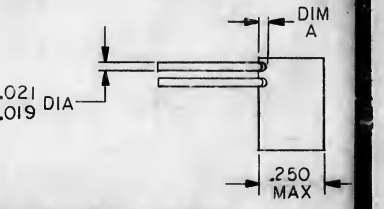


FIGURE 1





DIM. A	
-1	.080 .020
-2	.080 .000



© REPLACES REV B WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN E. Cooper DATE 12 June 63
CHECKED R. Green
APPROVAL Donald J. Bowler 6/11/63
APPROVAL Edwin C. Hall 11 June 63
NASA APPROVAL Jack Bennett
MIT APPROVAL Barry K. Bryant

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSFORMER, PULSE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006762
SCALE NONE
WT
SHEET 1 OF 1

B 1006784

REVISIONS TDRR 00189 12-20-62			
SYM	DESCRIPTION	DATE	APPROVAL
—	TAKEN FROM BUWEPS DWG 2401782	—	—
(A) A	REVISED PER TDRR 00444 ADDED SHEET 2	2-8-65	2-11-65
B	REVISED PER TDRR 22434	9/21/65	

NOTES:

1. REQUIREMENTS:

   A. ELECTRICAL:

      (1) OPERATING VOLTAGE: 1 KV RMS NOMINAL.

      (2) FLASH OVER:
      SEA LEVEL: 2.9 KV RMS.
      50,000 FEET ALTITUDE: 850 V.

      (3) CAPACITANCE: 1.07 MICROMICROFARADS MAXIMUM.

      (4) CURRENT RATING: 5.5 AMPERES, CONTINUOUS DUTY.

   B. CONSTRUCTION:

      (1) LUG:
      BERYLLIUM COPPER, PER QQ-C-530 CONDITION H GOLD PLATED IN ACCORDANCE WITH MIL-G-45204 TYPE II CLASS 1 (COPPER STRIKE)

      (2) INSULATION: POLYTETRAFLUOROETHYLENE (TEFLON, TFE), PER MIL-T-14073

   C. TEMPERATURE RANGE: -65°C TO +200°C.

   D. MARKING: THE UNIT, PACKAGE OR CONTAINER SHALL BE LEGIBLY AND PERMANENTLY MARKED WITH MANUFACTURER'S NAME AND/OR SYMBOL, NASA NUMBER, DASH NUMBER AND REVISION LETTER.

   E. TEST REQUIREMENTS:

      (1) AFTER INSTALLATION, THE FEEDTHRU SHALL WITHSTAND A PULL TEST OF FIVE (5) POUNDS MINIMUM.

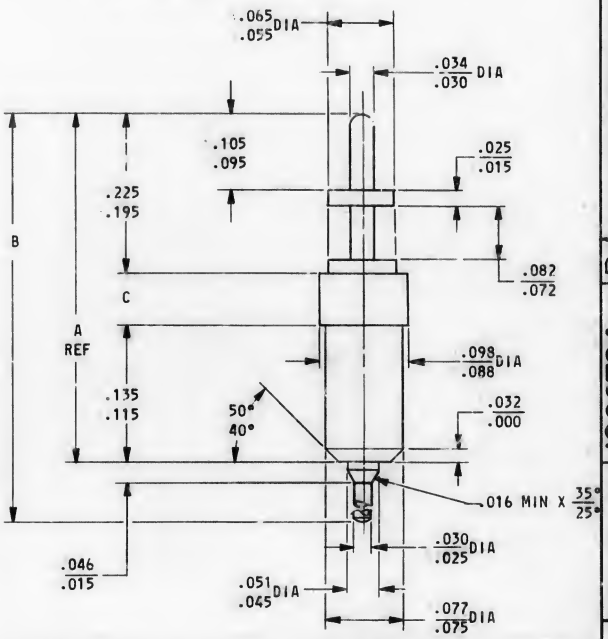
      (2) THE FEEDTHRU SHALL WITHSTAND AN AXIAL PULL TEST OF FIVE (5) POUNDS MINIMUM BETWEEN LUG AND TEFLON BUSHING.

G. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN NASA DOCUMENT PS 1015404 CLASS III.

3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

DASH NO	COLOR OF INSULATION	A REF	B	C
1	BROWN	.375	1.510 / 1.490	.045 / .035
2	RED			
3	ORANGE			
4	YELLOW			
5	GREEN			
6	BLUE			
7	VIOLET			
8	GRAY			
9	WHITE			
10	BLACK			
11	BROWN	.425	1.710 / 1.690	.095 / .085
12	RED			
13	ORANGE			
14	YELLOW			
15	GREEN			
16	BLUE			
17	VIOLET			
18	GRAY			
19	WHITE			
20	BLACK			

FIGURE 1
FOR DASH NUMBERS 1 THRU 20



PROCURE ONLY FROM APPROVED SOURCES LISTED ON ND1002034 FOR THIS DWG.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Ray Wheeler DATE 10 DEC 62
CHECKED H. Maynard 14 DEC 62
APPROVAL Joe Morton
APPROVAL
NASA APPROVAL 12-7-62
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

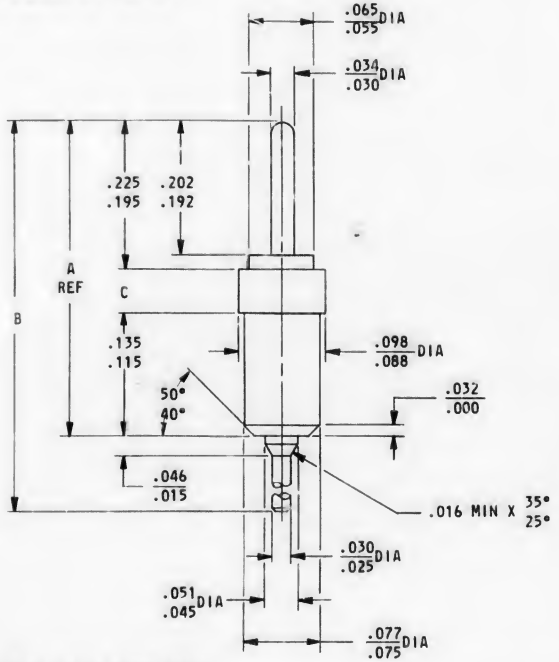
CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006784
SCALE NONE	WT	SHEET 1 OF 2

B 1006784

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR - THIS SHEET ADDED		WR
B	REVISED PER TDRR 22434	2/5/63	WR

DASH NO.	COLOR OF INSULATION	A REF	B	C
41	BROWN	.375	1.510	.045
42	RED			
43	ORANGE		1.490	.035
44	YELLOW			
45	GREEN			
46	BLUE			
47	VIOLET			
48	GRAY			
49	WHITE			
50	BLACK			
51	BROWN	.425	1.710	.095
52	RED		1.690	.085
53	ORANGE			
54	YELLOW			
55	GREEN			
56	BLUE			
57	VIOLET			
58	GRAY			
59	WHITE			
60	BLACK			

FIGURE 2
FOR DASH NUMBERS 41 THRU 60



REVISION A - THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTES**
HEAT TREATMENT **NONE**
FINAL FINISH **NONE**
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG. NO. | CONTRACT

DRAWN Ray Wheeler DATE 10 Dec 62
CHECKED W. Maynard 14 DEC '62
APPROVAL Joe Morton 2-8-63
APPROVAL D. Page 2-8-63
NASA APPROVAL Jack Bremer 2/5/63
MIT APPROVAL W. Kupfer W. Widder

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TERMINAL, FEEDTHRU
MICROMINIATURE INSULATED
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
80230	C	1006784

SCALE NONE | WT | SHEET 2 OF 2

1006784

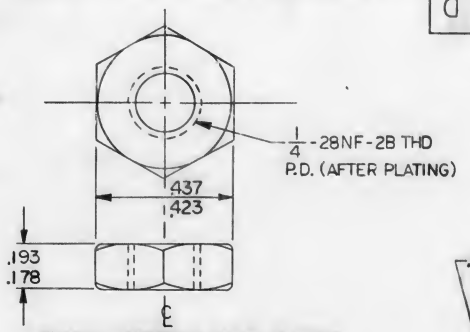
D 1679001

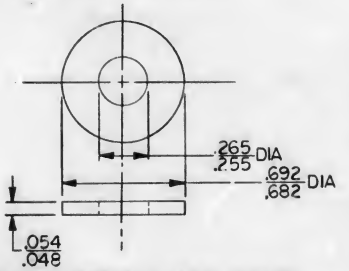
REVISIONS B 2680 TDRR 00631 3/4/63			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1636	6/19/67	LEE
C	REVISED PER TDRR 02820	8/28/63	DM
D	REVISED PER TDRR 04910	12/10/70	

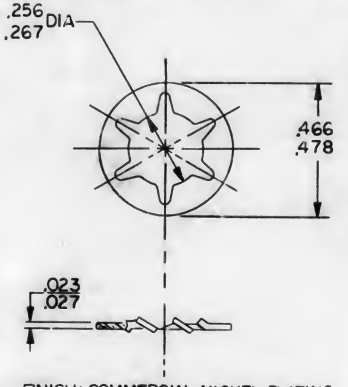
REQUIREMENTS:

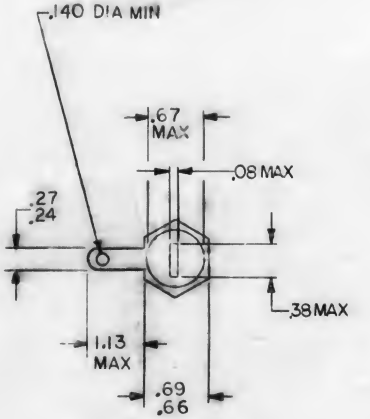
1. GENERAL:
   - A. UNITS SHALL MEET THE GENERAL SPECIFICATION REQUIREMENTS OF MIL-S-19500 EXCEPT AS MODIFIED HEREIN.
   - B. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS OF ND 1015404, CLASS 2.
   - C. THE PARTS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002051.
   - D. UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A. UNITS SHALL NOT BE PACKED IN ANY MANNER WHICH MAY CAUSE DAMAGE TO LEADS.
   - E. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. INSPECTION AND ACCEPTANCE:
   - A. MECHANICAL REQUIREMENTS:
     - (1) TERMINAL: LEAD SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) PER ND 1015402. CERTIFICATION OF COMPLIANCE TO THIS REQUIREMENT SHALL ACCOMPANY EACH LOT SHIPMENT.
   - B. MARKING:
     - (1) UNIT AND PACKAGES SHALL BE MARKED PER MIL-STD-130 WITH THE MANUFACTURER'S NAME/OR SYMBOL, TYPE DESIGNATION, NASA DRAWING NUMBER, DASH NUMBER, REVISION LETTER, POLARITY, AND LOT CODE IDENTIFICATION. THE UNIT SHALL BE MARKED WITH THE MANUFACTURER'S NAME.
   - C. ELECTRICAL CHARACTERISTICS: PER TABLE I.
     - (1) REVERSE CURRENT (I_R)
     - (2) FORWARD VOLTAGE (V_F)
     - (3) RECOVERY TIME (T_{RR})
     - (4) MAXIMUM OVERSHOOT (I_{OS})
     - (5) REVERSE BREAKDOWN (PIV)
3. DESIGN REQUIREMENTS:
   - A. MAXIMUM RATINGS AT 25°C.
     - (1) MAXIMUM RMS VOLTAGE (V_{AC}): 70 VOLTS (INTO RESISTIVE LOAD).
   - B. TEMPERATURE RATINGS:
     - (1) OPERATING CASE TEMPERATURE (T_C) WITHOUT DERATING: -65°C TO +100°C.
     - (2) STORAGE TEMPERATURE: -65°C TO +175°C.
     - (3) THERMAL RESISTANCE: JUNCTION TO CASE 2°C/WATT
   - C. CONSTRUCTION:
     - (1) SEMICONDUCTOR MATERIAL: SILICON.
     - (2) CASE MATERIAL: GOLD PLATED MILLED STEEL.
     - (3) INSULATOR DISC: ALUMINA CERAMIC SILVER BRAZED TO BASE OF DO-5 CASE.
     - (4) STUD MATERIAL: GOLD PLATED OFHC COPPER.
     - (5) STUD TORQUE: SHALL BE CAPABLE OF 30 INCH-POUNDS MAXIMUM.
   - D. MAXIMUM FORWARD SURGE CURRENT: 300 AMPS, 1/2 CYCLE, 60 CPS, OPERATING AT CASE TEMPERATURE (T_C) 100°C.

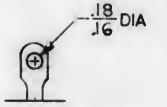
PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

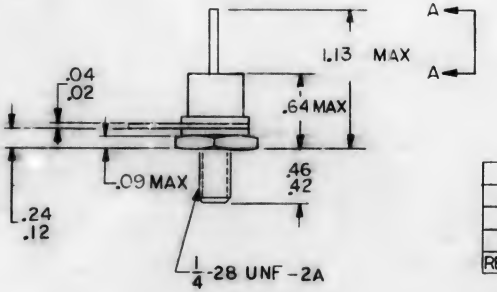












D	D
C	B
B	B
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

(B) REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

DRAWN DATE 12 JUNE 63
CHECKED
APPROVAL 4/4/63
APPROVAL 19 June 63

SEMICONDUCTOR DEVICE, DIODE, POWER-INSULATED BASE
SPECIFICATION CONTROL DRAWING

NASA APPROVAL 6/9/67
MIT APPROVAL

CODE IDENT NO. —
SIZE C
NASA DRAWING NO. 1006791
SCALE NONE WT
SHEET 1 OF 2

1679001

1629001

REVISIONS B REVISED TDRR 00634 5/24/63			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A RELEASE PER TDRR 1634	6/19/63	K.E.K.
D	REVISED PER TDRR 04910	12/10/63	[illegible]

TABLE I ACCEPTANCE INSPECTION

TEST	ELECTRICAL CHARACTERISTICS					
	CONDITIONS	SYMBOL	LIMITS MIN	LIMITS MAX	UNIT	LTPD %
REVERSE BREAKDOWN	I_R = 10 ma; 25°C	PIV	100	-	VOLTS	5
REVERSE CURRENT	V_R = 30 V; 100°C	I_R	-	10	ma	
FORWARD VOLTAGE	I_F = 30 AMP DC AT 25°C	V_F	-	1.4	VDC	
RECOVERY TIME *	I_F = 1 AMP TO 30 VDC REVERSE PER TEST CIRCUIT	T_{RR}	-	200	NANO-SEC	
PEAK OVERSHOOT	AS MEASURED DURING RECOVERY TIME TEST	I_{OS}	-	3	AMPS	

* SEE FIG. 1 AND 2.

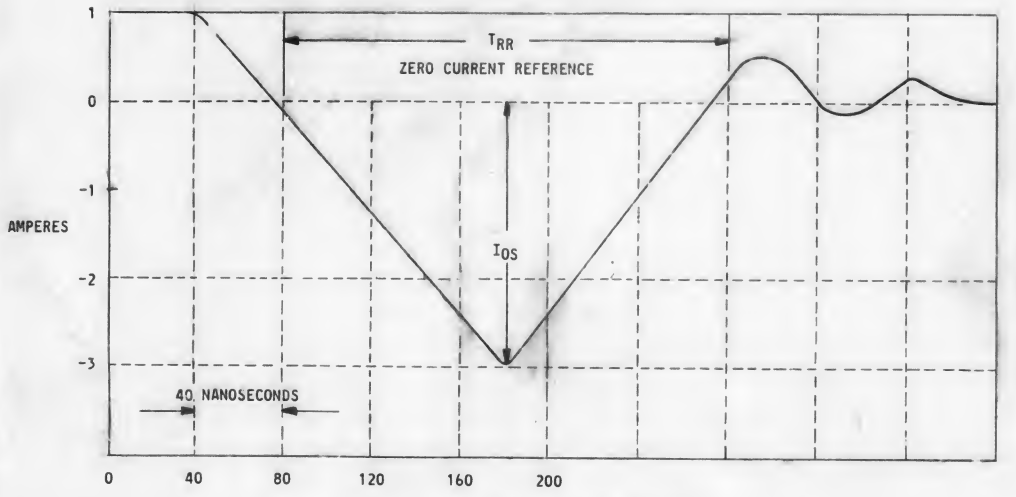


FIG. 1 TYPICAL RECOVERY PATTERN

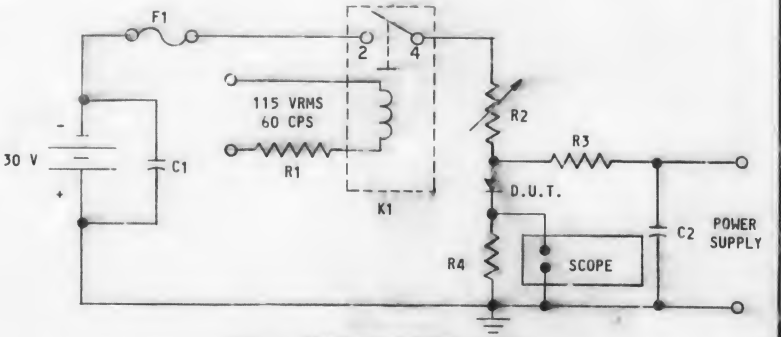


FIG. 2 RECOVERY TIME TEST CIRCUIT

BATTERIES - 5 BURGESS 4F4H(6 VOLT) SERIES
C1, C2 - 1 UF ± 10% 300 VDC OIL FILLED
R1 - 10K 2W 5%
R2 - 3 OHM 25W POTENTIOMETER
R3 - 30 OHM 30 WATTS 10% CARBON FILM NON-INDUCTIVE
R4 - 1 OHM 10W 1% NON-INDUCTIVE
K1 - HGP-1002 CLARE
F1 - SLO-BLO- 1 AMP
SCOPE - TEKTRONIX 541 OR 545 WITH 53/54K PREAMPLIFIER, P-6000 1:10 ISOLATION PROBE OR EQUIVALENT.
POWER SUPPLY - 35 VOLTS AT 1.0 AMPERE MINIMUM, RIPPLE 3 MILLIVOLTS RMS OR LESS, OUTPUT IMPEDANCE 1/2 OHM MAXIMUM, DC TO 2000 CPS.
NOTE: WIRE AND ADJUST R2 SO RESISTANCE FROM RELAY TO ANODE OF D.U.T. IS 1.4 ± .05 OHMS, INDUCTANCE LESS THAN 2 MICROHENRIES.

(B) REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN H. Runnin DATE 3 JUNE 63
CHECKED J. Rogers
APPROVAL R.B. Thomas 6/10/63
APPROVAL Elden C. Hall 18 JUNE 63
NASA APPROVAL [illegible] 6/19/63
MIT APPROVAL [illegible] 6/19/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SEMICONDUCTOR DEVICE, DIODE, POWER-INSULATED BASE
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
———	C	1006791

SCALE NONE WT SHEET 2 OF 2

8679001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
–	CLASS A RELEASE PER TDRR 02005	7-17-63	
A	REVISED PER TDRR 02816	8/28/63	
B	REVISED PER TDRR 14595	[illegible]	
C	REVISED PER TDRR 16803	3/2/65	

REQUIREMENTS

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.

   D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.

   E. MARKING: UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE MANUFACTURER'S NAME, NASA DRAWING NUMBER AND REVISION LETTER, INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE AND DATE OF MANUFACTURE OR CODE.

   F. PREPARATION FOR DELIVERY SHALL BE IN ACCORDANCE WITH ND 1002215 CLASS 1, CODE 1.
      (1) MARKING OF SHIPPING CONTAINERS SHALL CONFORM TO THE MARKING OF UNIT AND INTERMEDIATE PACKAGES AND THE METHODS OF MARKING AS SPECIFIED IN ND1002215.

2. ACCEPTANCE AND INSPECTION

   A. MECHANICAL PROPERTIES:

      (1) LEAD MATERIAL: WELDABLE, FLEXIBLE GOLD PLATED IRGN-NICKEL ALLOY PER ND PS1015401.

      (2) DIMENSIONS AND TOLERANCES: AS SPECIFIED HEREIN.

   B. ELECTRICAL CHARACTERISTICS:

      (1) INDUCTANCE: 50 MICROHENRIES MINIMUM AT 2.2 AMPERES DIRECT CURRENT, ±10%. TEST FREQUENCY IS 50 KC ±1% AT 10 VRMS ±10%.

      (2) DIRECT CURRENT RESISTANCE: 0.08 OHMS MAXIMUM.

      (3) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES.(RESTING ON A METAL PLATE) WITHOUT LEADS

      (4) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC

   C. VENDOR SUPPLIED DATA: EACH SHIPMENT OF PARTS SHALL BE ACCOMPANIED BY THE FOLLOWING DOCUMENTATION.

      (1) CERTIFICATE OF COMPLIANCE WITH LEAD MATERIAL REQUIREMENT.

      (2) CERTIFICATE OF COMPLIANCE WITH ND1015404 CLASS 2.

      (3) BURN-IN TEST DATA.

3. DESIGN:

   A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.020 COVERAGE OVER THE WINDING.

   B. MAXIMUM OPERATING CASE TEMPERATURE (UNDER TEST CONDITIONS B1) AT +85°C.

   C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.

   D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.

   E. LEAD WORKMANSHIP: LEADS SHALL BE UNIFORM IN QUALITY AND TEMPER: CLEAN, SOUND, SMOOTH AND FREE FROM INJURIOUS FOREIGN MATERIALS.

   F. UNIT SHALL BE CAPABLE OF CONTINUOUS UNINTERRUPTED OPERATION.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

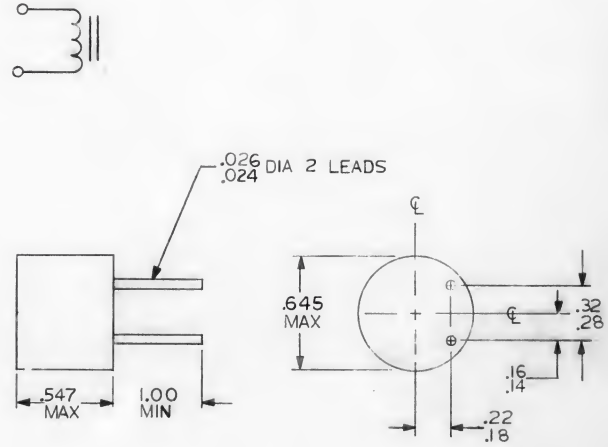
4. SPECIAL CONDITIONING:

   A. BURN-IN: BURN-IN SHALL BE PERFORMED BY THE VENDOR.

   (1) RUN THE UNIT AT 85°C AMBIENT WITH 2.2 AMPERES DC FLOWING FOR 50 HOURS.

   (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.

   (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL NOT BE SHIPPED.



QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

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TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE MASS.
DWG. NO. CONTRACT
DRAWN [signature] DATE 7/1/63
CHECKED [signature] 7/1/63
APPROVAL
APPROVAL [signature] 7/12/63
NASA APPROVAL [signature] 5-17-63
MIT APPROVAL [signature] 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006798

SCALE NONE WT SHEET / OF /

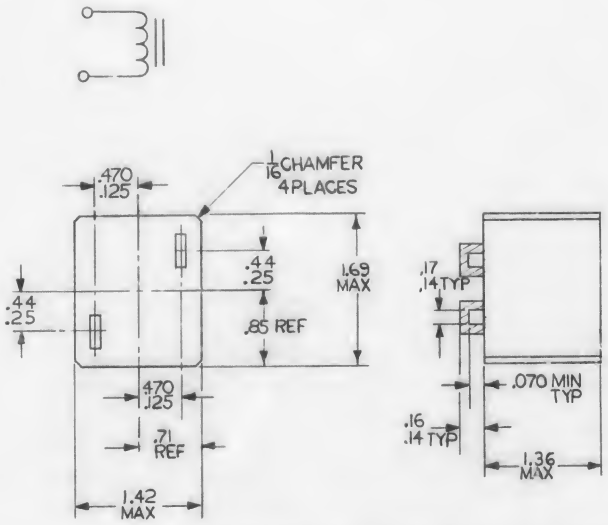
8679001

— 0089001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
-	CLASS A RELEASE PER TDRR 02004	7-17-63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-T-27 GRADE 5, CLASS S, IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002047.
   - E. MARKING AND PACKAGING:
     - (1) UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED PER MIL-STD-130, WITH THE INDUCTANCE VALUE, DIRECT CURRENT RESISTANCE, NASA DRAWING NUMBER, REVISION LETTER AND DATE CODE.
     - (2) PACKAGES SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL PLUS THE NASA PART NUMBER.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: SQUARE ANNEALED COPPER WIRE TINNED AND TERMINATED AS SHOWN ON THIS DRAWING.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE: 150 MICROHENRIES MINIMUM AT 8.0 AMPERES DIRECT CURRENT. TEST FREQUENCY IS 50 KC AT 10 VRMS.
     - (2) DIRECT CURRENT RESISTANCE: 0.025 OHMS MAXIMUM.
     - (3) Q FACTOR: 50 MINIMUM AT 50 KC
     - (4) TEST VOLTAGE: 500 VRMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS
     - (5) INSULATION RESISTANCE: 10,000 MEGOHMS MINIMUM AT 500 VDC
3. DESIGN REQUIREMENTS:
   - A. CONSTRUCTION: ENCAPSULATED WITH AT LEAST 0.030 COVERAGE OVER THE WINDING.
   - B. MAXIMUM OPERATING CASE TEMPERATUPE (UNDER TEST CONDITIONS B1) AT +85°C
   - C. DIELECTRIC WITHSTANDING VOLTAGE AT 120,000 FEET: 100 VOLTS RMS BETWEEN WINDING AND ALL SURFACES (RESTING ON A METAL PLATE) WITHOUT LEADS.
   - D. TERMINAL PULL: UNIT SHALL WITHSTAND AN AXIAL PULL OF 4 POUNDS, MINIMUM, WHEN APPLIED WITHOUT SHOCK, FOR 5 SECONDS.
4. SPECIAL CONDITIONING:
   - A. BURN-IN:
     - (1) RUN THE UNIT AT 85°C AMBIENT WITH 8 AMPERES DC FLOWING FOR 50 HOURS.
     - (2) WITHIN FOUR (4) HOURS AFTER THE TEST MEASURE THE INDUCTANCE AND DC RESISTANCE.
     - (3) IF THE ABOVE TWO VALUES EXCEED THE SPECIFIED TOLERANCE, OR CHANGE MORE THAN 5% THE UNIT SHALL BE REJECTED.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN DATE 7/1/63
CHECKED 7/1/63
APPROVAL
APPROVAL 7/1/63
NASA APPROVAL 7-17-63
MIT APPROVAL 7/17/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006800
SCALE	WT	SHEET 1 OF 1

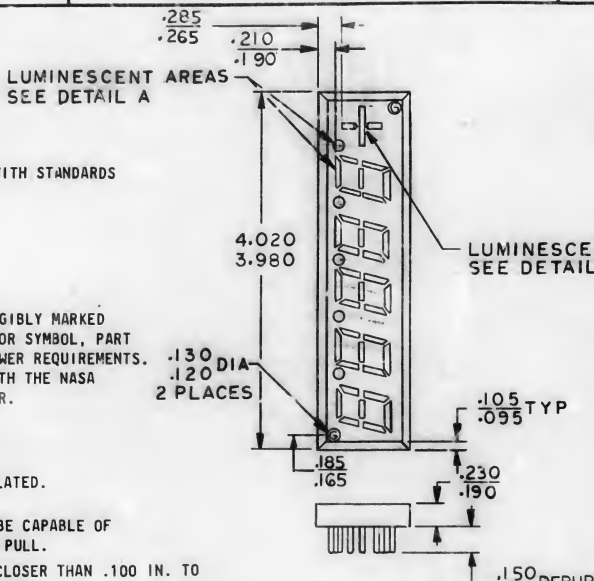
1006800

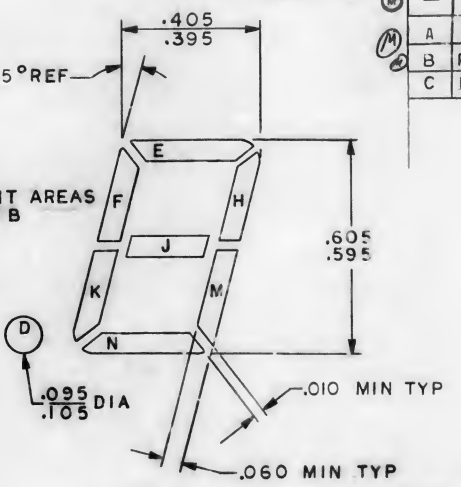
C 2189001

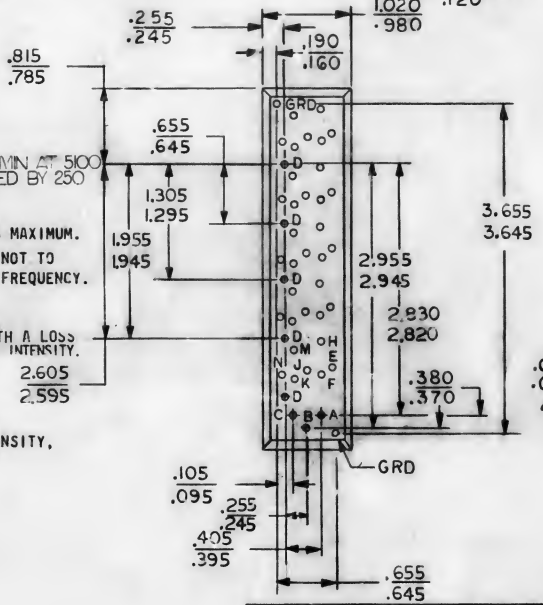
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	7/5/63	
B	REVISED PER TDRR 04185	10/24/63	
C	REVISED PER TDRR 04402	5/4/64	

NOTES:

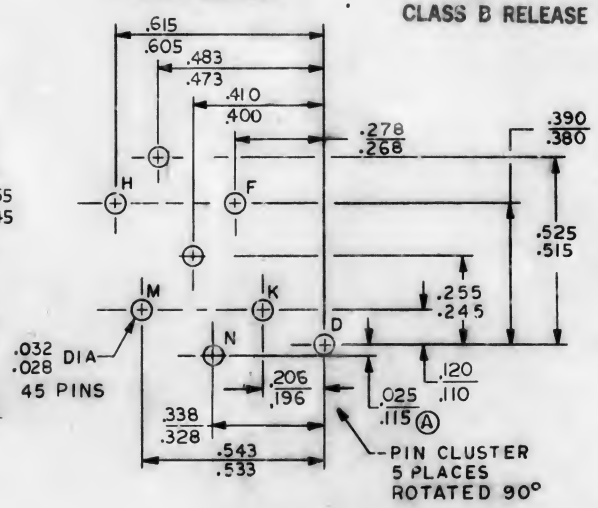
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED.
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM, WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.

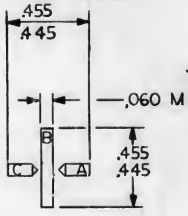






DETAIL A
5 PLACES
ROTATED 90°





DETAIL B

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 6/9/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Cooper DATE 5/24/63
CHECKED J. Ryan DATE 5/24/63
APPROVAL [signature] 6/4/63
APPROVAL Ellen C Hall 10 June 63
NASA APPROVAL [signature]
MIT APPROVAL [signature]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006813
SCALE NONE	WT	SHEET 1 OF 1

C 1006814

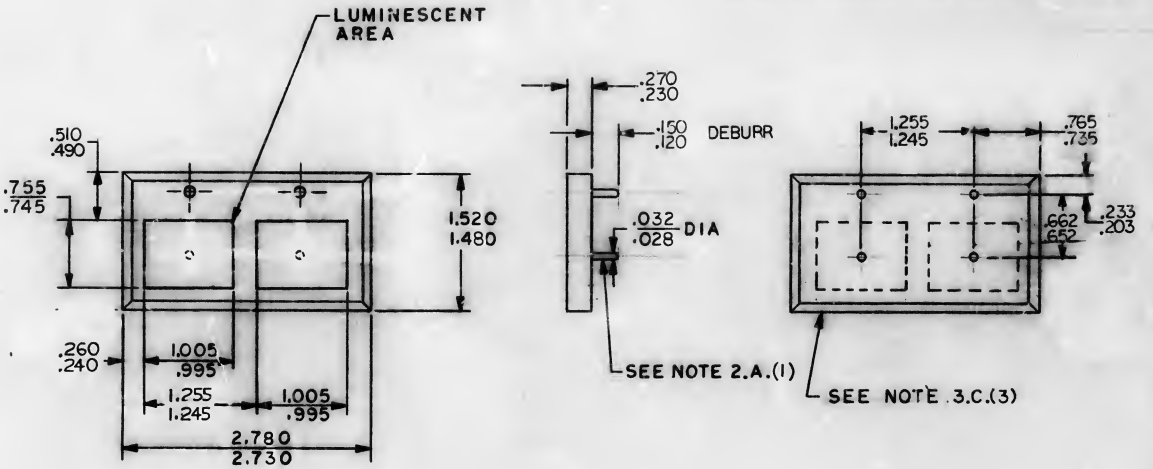
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/5/63	[illegible]
B	REVISED PER TDRR 04180	10/10/63	[illegible]
C	REVISED PER TDRR 07102	2/24/64	[illegible]

NOTES:

1. GENERAL REQUIREMENTS:
   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER PER MIL-STD-129.
2. ACCEPTANCE AND INSPECTION (100%):
   A. MECHANICAL PROPERTIES:
      (1) LEAD MATERIAL: BRASS, TIN PLATED.
      (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
      (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01559 DATE 4/9/63



   B. ELECTRICAL CHARACTERISTICS:
      (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250 ±25V @ 800 ±10 CPS SQ WAVE
      (2) POWER FACTOR: 0.25 MAXIMUM.
      (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
      (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY
   B. CONSTRUCTION:
      (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
      (2) INSULATION BOARD: XXXP PLASTIC.
      (3) PROTECTIVE FRAME: ALUMINUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Crespi DATE 13 May 63
CHECKED [illegible] DATE 21 May 63
APPROVAL [illegible] 6/14/63
APPROVAL Ellen C. Hall 12 June 63
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY-ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006814

SCALE NONE WT SHEET 1 OF 1

1006815 D

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sep 63	WK
C	REVISED PER TDRR 04181	10/30/63	WK
D	REVISED PER TDRR 08860	6/1/64	WK

NOTES:

1. GENERAL REQUIREMENTS:

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. THIS UNIT SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-R-5757 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.

C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.

D. THIS UNIT SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002046 UNLESS OTHERWISE SPECIFIED HEREIN. ELECTRICAL REQUIREMENTS CONTAINED HEREIN SHALL TAKE PRECEDENCE OVER THOSE LISTED IN ND 1002046. THE CLASSIFICATION OF THIS RELAY SHALL BE LOW-LEVEL AS STATED IN THE DESIGN REQUIREMENTS SECTION OF THIS DRAWING.

2. ACCEPTANCE AND INSPECTION:

A. SAMPLING: UNLESS OTHERWISE SPECIFIED, SAMPLING FOR ALL REQUIREMENTS UNDER ACCEPTANCE AND INSPECTION SHALL BE IN ACCORDANCE WITH MIL-STD-105, LEVEL I, AQL OF 4.0 PERCENT.

B. MECHANICAL REQUIREMENTS:

(1) LEAD MATERIAL: LEAD MATERIAL SHALL BE IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH PS 1015402. A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

(2) MARKING:

(a) UNITS SHALL BE MARKED IN ACCORDANCE WITH ND 1002019 WITH THE FOLLOWING:
NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER.
DATE CODE (SHALL CONSIST OF A FOUR DIGIT NUMBER, THE FIRST TWO DIGITS OF WHICH SHALL BE THE LAST TWO DIGITS OF THE YEAR, AND THE SECOND TWO DIGITS SHALL BE THE NUMBER OF THE WEEK OF THE YEAR).
DC COIL RESISTANCE AT 25 DEGREES CENTIGRADE MUST OPERATE CURRENT, MAXIMUM.
SCHEMATIC DIAGRAM.
BLUE BEADING AROUND TERMINALS 1.

(b) INTERMEDIATE AND EXTERIOR PACKAGING AND PACKING SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129, BOTH INTERNALLY AND EXTERNALLY WITH THE NASA DRAWING NUMBER, REVISION LETTER AND DASH NUMBER, SUPPLIERS NAME, LOT NUMBER, AND DATE OF MANUFACTURE.

(3) DIMENSIONS: DIMENSIONS SHALL BE AS SPECIFIED HEREIN. LEADS SHALL BE SYMMETRICALLY POSITIONED WITH RESPECT TO ℄ OF HEADER WITHIN .010 INCH.

(4) SEAL: UNITS SHALL BE HERMETICALLY SEALED. SEAL TEST III OF MIL-R-5757 SHALL BE PERFORMED ON 100 PERCENT OF UNITS PROCURED.

C. ELECTRICAL REQUIREMENTS:

(1) COIL CURRENT: PULL-IN AND DROP-OUT IN ACCORDANCE WITH TABLE I.

(2) COIL RESISTANCE: IN ACCORDANCE WITH TABLE I.

(3) CONTACT RESISTANCE: SHALL BE 1.0 OHM MAXIMUM WHEN MEASURED WITH 100 MILLIAMPERES FROM A 6 VDC OPEN CIRCUIT VOLTAGE (CONTACTS SHALL NOT SWITCH THE MEASURING LOAD). 100 PERCENT OF UNITS PROCURED SHALL BE INSPECTED FOR THIS CHARACTERISTIC.

(4) DIELECTRIC STRENGTH:

(a) AT SEA LEVEL: 1000 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND OTHER CIRCUITS, THE COIL AND THE FRAME. 500 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM BETWEEN OPEN CONTACTS.

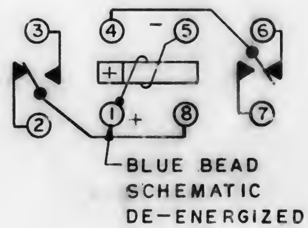
(5) INSULATION RESISTANCE: 1000 MEGOHMS MINIMUM AT 500 VOLTS DC BETWEEN MUTUALLY INSULATED TERMINALS, OPEN SWITCHING CONTACTS ENERGIZED OR NOT, COIL AND CASE AT PLUS 25 DEGREES CENTIGRADE (500 MEGOHMS AT 125 DEGREES CENTIGRADE), CONTACTS AND FRAME.

(6) OPERATE AND RELEASE TIME: EACH 10 MILLISECONDS MAXIMUM AT SUGGESTED SOURCE VOLTAGE OF TABLE I. WHEN TESTED PER THE APPLICABLE CIRCUIT OF MIL-R-5757

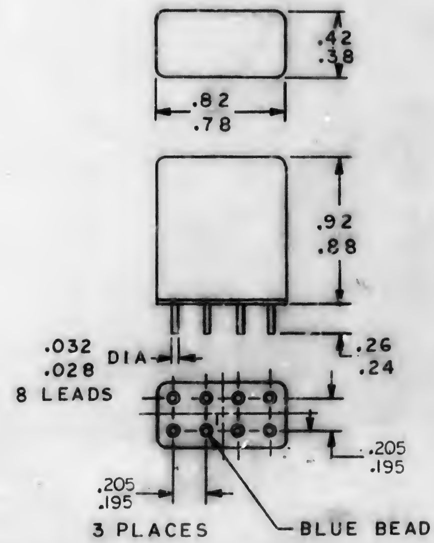
(7) TRANSFER TIME: 1.0 MILLISECOND MAXIMUM.

(8) CONTACT BOUNCE: 1.0 MILLISECOND MAXIMUM.

(9) CONTACT CHATTER: 10.0 MICROSECONDS MAXIMUM DURING VIBRATION AND SHOCK AS SPECIFIED IN ND 1002046.



SCHEMATIC DE-ENERGIZED



Ⓑ REPLACES REV (A) WITH CHANGES

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO. CONTRACT
DRAWN C. Cass DATE 29 Aug 63
CHECKED J. Ruggeri Aug 29 63
APPROVAL
APPROVAL Ralph C Hall 5 Sept 63
NASA APPROVAL 9/3/63
MIT APPROVAL W Kupfer 5 Sep 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
——	C	1006815

SCALE NONE | WT | SHEET 1 OF 2

D 9189001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES PER TDRR 02965	5 Sept 63	WH
C	REVISED PER TDRR 04181	10 Oct 63	WH
D	REVISED PER TDRR 08860	6/2/64	WH

NOTES (CONTINUED)

3. DESIGN REQUIREMENTS:

A. ELECTRICAL RATINGS:

(1) COIL VOLTAGE (SUGGESTED SOURCE): IN ACCORDANCE WITH TABLE I.

(2) COIL POWER: 1.5 WATTS MAXIMUM AT PLUS 25 DEGREES CENTIGRADE DERATED TO 0.5 WATT AT PLUS 125 DEGREES CENTIGRADE.

(3) CONTACT RATING (PER POLE): 2 AMPERES AT 28 VOLTS DC OR 1 AMPERE AT 115 VOLTS RMS, 60 OR 400 CPS, WITH RESISTIVE LOAD.

(4) CONTINUOUS COIL CURRENT, MAXIMUM: IN ACCORDANCE WITH TABLE I.

(5) CONTACTS SHALL BE CAPABLE OF SWITCHING DRY-CIRCUIT CONDITIONS WITH THE STIPULATION THAT NO LOAD GREATER THAN 100 MILLIAMPERES HAD BEEN SWITCHED PRIOR TO DRY-CIRCUIT LOAD.

(6) LEAD STRENGTH: UNITS SHALL WITHSTAND AN AXIAL PULL OF 3 POUNDS MIN.

(7) COIL PULL-IN POWER (SENSITIVITY) IN ACCORDANCE WITH TABLE I.

(8) DIELECTRIC STRENGTH:

(a) AT 70,000 FEET: 300 VOLTS DC MINIMUM FOR 5 SECONDS MINIMUM WITHOUT DAMAGE, ARCING, OR BREAKDOWN BETWEEN EACH SWITCHING CIRCUIT AND ALL OTHER CONNECTIONS INCLUDING THE FRAME.

B. CONSTRUCTION:

(1) CONTACT FORM AND SWITCHING ACTION: 2 FORM C CONTACTS (BREAK BEFORE MAKE) DOUBLE POLE, DOUBLE THROW, POLARIZED WITH MAGNETIC BIAS.

(2) CONTACT MATERIAL: GOLD PLATED SILVER OR GOLD PLATED TRANSFER SPRING WITH HARDENED SILVER ALLOY FIXED CONTACTS.

C. QUALIFICATION REQUIPEMENTS:

(1) LIFE: LIFE OF THIS UNIT SHALL BE 100,000 CYCLES MINIMUM WHEN TESTED PER NO 1002046. FOR THE LIFE TESTS, THE CLASSIFICATION OF THIS RELAY MAY BE GENERAL PURPOSE OR LOW-LEVEL WITH THE STIPULATION AS STATED UNDER CONTACT RATING.

D. ENVIRONMENTAL REQUIREMENTS:

(1) HUMIDITY (MOISTURE RESISTANCE): UNITS SHALL BE CAPABLE OF WITHSTANDING RELATIVE HUMIDITY UP TO 100 PERCENT.

(2) OPERATING TEMPERATURE RANGE: UNITS SHALL BE CAPABLE OF OPERATING WITHIN THE ELECTRICAL REQUIREMENTS OF THIS SPECIFICATION WHEN EXPOSED TO AMBIENT TEMPERATURES FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(3) THERMAL SHOCK: UNITS SHALL BE CAPABLE OF WITHSTANDING THERMAL SHOCK FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 125 DEGREES CENTIGRADE.

(4) THE SALT SPRAY TEST PER MIL-R-5757 IS NOT APPLICABLE.

4. SPECIAL CONDITIONING:

A. THE MANUFACTURER SHALL SUBJECT EACH RELAY TO THE MISS TEST AS FOLLOWS:

(1) LOAD SHALL BE 20 MICROAMPERES MAXIMUM (RESISTIVE) AT 20 MILLIVOLTS MAXIMUM OPEN CIRCUIT VOLTAGE.

(2) TEST SPEED SHALL BE 5 CYCLES, OR LESS, PER SECOND.

(3) EACH RELAY SHALL OPERATE FOR 5,000 CYCLES.

(4) EACH RELAY SHALL BE MONITORED FOR OPENS, SHORTS AND CONTACT RESISTANCE WHICH SHALL NOT EXCEED 1000 OHMS.

(5) OCCURRENCE OF ANY OF THESE EVENTS SHALL CONSTITUTE A MISS AND SHALL BE CAUSE FOR REJECTION OF RELAY.

(6) CONTACT RESISTANCE AND MAXIMUM PULL-IN CURRENT, SHALL BE MEASURED BY THE MANUFACTURER AFTER THE 5,000 CYCLE TEST AND JUST PRIOR TO SHIPMENT. CERTIFICATION OF THESE MEASUREMENTS SHALL ACCOMPANY EACH SHIPMENT. ONE COPY OF A TABULATION, SHOWING THE NUMBER OF RELAYS SUBJECTED TO THE 5,000 CYCLE TEST, THE NUMBER OF RELAYS FAILING THE 5,000 CYCLE TEST AND THE TIME (OR CYCLE) OF FAILURE SHALL ACCOMPANY EACH SHIPMENT.

(7) TEST READINGS FOR REQUIREMENTS SPECIFIED IN NOTES 2C1, 3, 6, 7, 8 FOR EACH RELAY TAKEN BEFORE AND AFTER BURN-IN SHALL BE SUBMITTED WITH EACH LOT.

TABLE I

DASH NO.	COIL RESISTANCE OHMS @ 25°C MIN - MAX	PULL-IN CURRENT MADC MAX POSITIVE	CONTINUOUS CURRENT @ 125°C MADC MAX	SUGGESTED SOURCE VOLTAGE VDC	OPERATE SENSITIVITY MW NOM.	DROP-OUT CURRENT MADC MIN POSITIVE
-1	539 - 441	14.5	23	12.5	100	2.0
-2	720 - 880	11.2	18	16	100	1.5

(B) REPLACES REV A WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN C. Crespo DATE 29 Aug 63
CHECKED J. Reggia DATE 29 Aug 63
APPROVAL
APPROVAL Edmund Hall 29 Aug 63
NASA APPROVAL 9/5/63
MIT APPROVAL 5 Sept 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RELAY, ARMATURE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006815

SCALE NONE WT SHEET 2 OF 2

1006815 D

MASTER

E 4189001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01483	4/5/63	EGH / JAF
B	REVISED PER TDRR 1632	4/19/63	E.E.C.
C	REVISED PER TDRR 02766	5/5/63	JAF
D	REVISED PER TDRR 04167	5/22/63	WPC
E	REVISED PER TDRR 04401	5/22/63	WPC

NOTES:

1. GENERAL REQUIREMENTS:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.

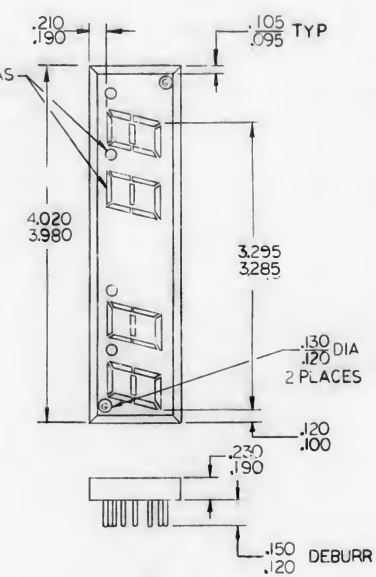
2. ACCEPTANCE AND INSPECTION (100%):

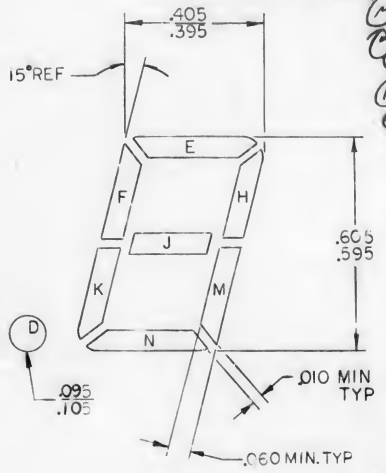
   A. MECHANICAL PROPERTIES:

   (1) LEAD MATERIAL: BRASS, TIN PLATED

   (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.

   (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).

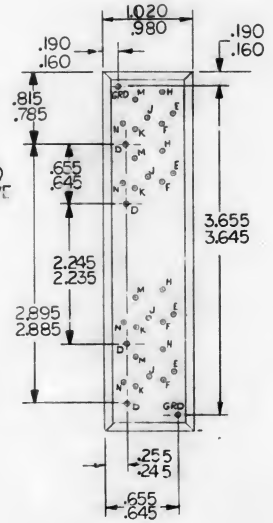




DETAIL A
4 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63



   B. ELECTRICAL CHARACTERISTICS:

   (1) LIGHT INTENSITY: 10 FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE

   (2) POWER FACTOR: 0.25 MAXIMUM.

   (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.

   (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.

3. DESIGN REQUIREMENTS:

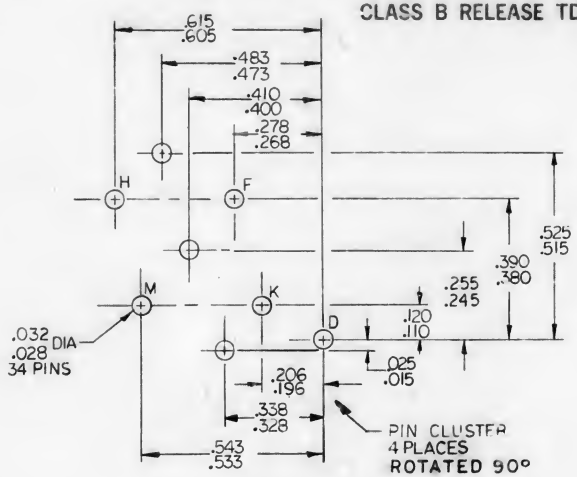
   A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.

   B. CONSTRUCTION:

   (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.

   (2) INSULATION BOARD: XXXP PLASTIC.

   (3) PROTECTIVE FRAME: ALUMINUM.



PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN [illegible] DATE 5/22/63
CHECKED [illegible] 13 May 63
APPROVAL [illegible] 22 May 63
APPROVAL Edwin C Hall 6/5/63
NASA APPROVAL [illegible] 5/22/63
MIT APPROVAL [illegible] 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006817
SCALE NONE	WT	SHEET 1 OF 1

1006817

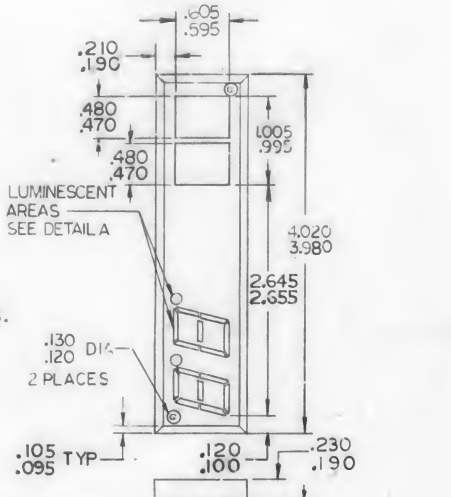
8189001

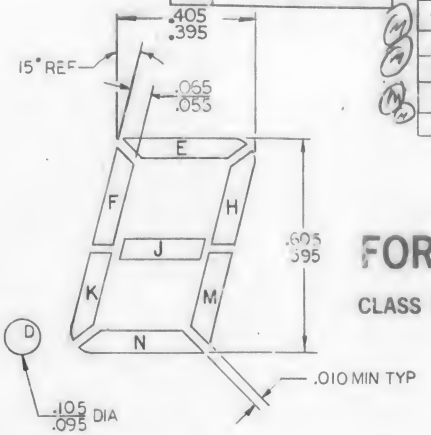
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 01484	6/15/63	
B	REVISED PER TDRR 02966	9/15/63	
C	REVISED PER TDRR 04484	10/4/63	
D	REVISED PER TDRR 04400	5 Nov 63	

NOTES:

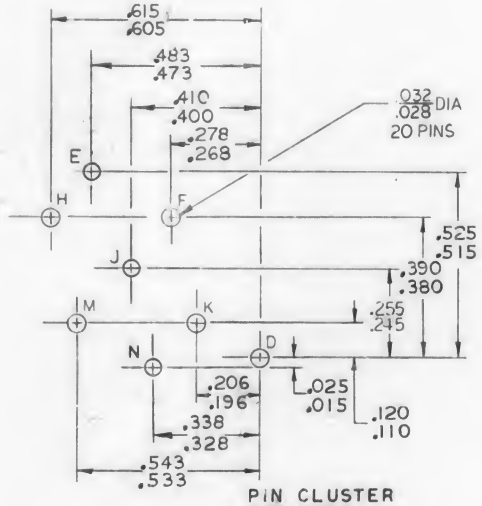
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%):
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS. SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NEUTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.





DETAIL A
2 REQD
ROTATED 90°



PIN CLUSTER
2 PLACES
ROTATED 90°

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN [illegible] DATE 7 MAY 63
CHECKED W.J. Gifford / M. Wagenfeld (3 MAY 63)
APPROVAL F.T. Grimsdell 22 MAY 63
APPROVAL Helen C Hall 6/5/63
NASA APPROVAL W.J. Senuk 5/21/63
MIT APPROVAL J. Wolf 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY—ELECTROLUMINESCENT

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006818

SCALE NONE WT SHEET 1 OF 1

1006818

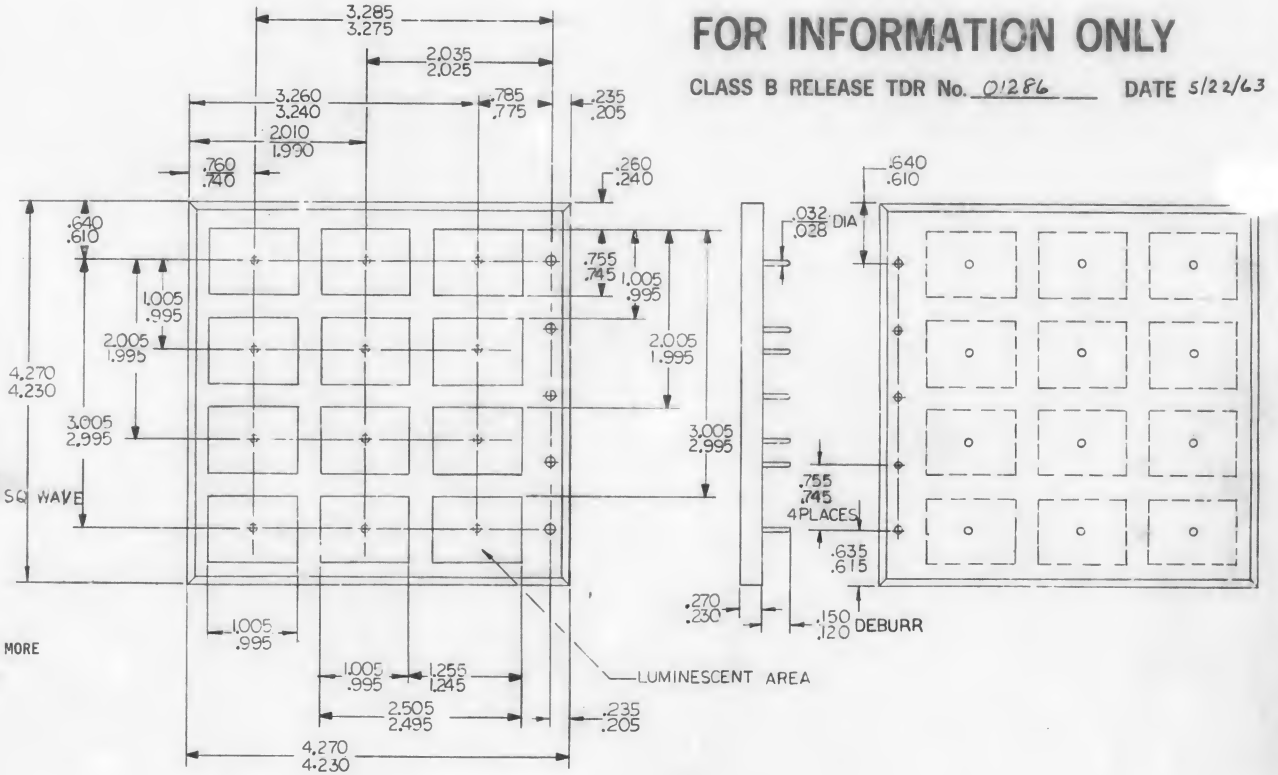
B 6189001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
—			
A	REVISED PER TDRR 02966	9/3/63	
B	REVISED PER TDRR 04183	10/21/63	

NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTITY, AND POWER REQUIREMENTS. EACH CONTAINER SHALL BE MARKED WITH THE NASA DRAWING NUMBER AND REVISION LETTER.
2. ACCEPTANCE AND INSPECTION (100%)
   - A. MECHANICAL PROPERTIES:
     - (1) LEAD MATERIAL: BRASS, TIN PLATED
     - (2) LEAD STRENGTH: LEADS SHALL BE CAPABLE OF WITHSTANDING A 4 POUND AXIAL PULL.
     - (3) THE METAL FRAME SHALL BE NO CLOSER THAN .100 IN. TO ANY ELECTRICAL CONNECTIONS (LEADS).
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) LIGHT INTENSITY: 10-FOOT LAMBERTS MIN AT 5100 ANGSTROMS (NOMINAL) WHEN EXCITED BY 250±25 V AT 800±10 CPS SQ WAVE
     - (2) POWER FACTOR: 0.25 MAXIMUM.
     - (3) PEAK CONTINUOUS VOLTAGE: 420 VOLTS MAXIMUM.
     - (4) PEAK TRANSIENT VOLTAGE: 500 VOLTS NOT TO EXCEED ONE HALF CYCLE AT OPERATING FREQUENCY.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM. WITH A LOSS OF NOT MORE THAN 55% OF ORIGINAL LIGHT OUTPUT INTENSITY.
   - B. CONSTRUCTION:
     - (1) GLASS SUBSTRATE: GREY, NECTRAL DENSITY, 70% TRANSMISSION.
     - (2) INSULATION BOARD: XXXP PLASTIC.
     - (3) PROTECTIVE FRAME: ALUMINUM.
4. SPECIAL CONDITIONING: TBS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01286 DATE 5/22/63

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. | CONTRACT
DRAWN R.M. Langer DATE 7 MAY 63
CHECKED J. Ruggiero / H. Reynolds
APPROVAL T.S.O'Donnell 22 May 63
APPROVAL
NASA APPROVAL 5/22/63
MIT APPROVAL 5/22/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INDICATOR, DIGITAL DISPLAY— ELECTROLUMINESCENT
SPECIFICATION CONTROL DRAWING

CODE IDENT NO. —— | SIZE C | NASA DRAWING NO. 1006819
SCALE NONE | WT | SHEET 1 OF 1

MASTER

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

   B. SWITCH SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S- 6744 EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.

   C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND1015404, CLASS 2.

   D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055, AS AMENDID HEREIN.

   E. MARKING: UNITS SHALL BE MARKED ND1002019 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, SWITCH NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

2. ACCEPTANCE AND INSPECTION:

   A. TERMINALS: SHALL BE PLATED FOR SOLDERING.
   CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.

   B. CONTACT ARRANGEMENT: PER TABLE

   C. DIELECTRIC WITHSTANDING VOLTAGE: 1000 VOLTS RMS (2 MILLIAMPS MAXIMUM LEAKAGE).

   (1) AT 65,000 FEET: 300 VOLTS RMS. (2 MILLIAMPS MAXIMUM LEAKAGE)

   D. ACTUATING FORCE: ONE-HALF (1/2) TO THREE (3) POUNDS.

   E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:

   A. TEMPERATURE RANGE: -65°F TO +250°F.

   B. CONTACT RATING:

   (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET).
   RESISTIVE: 5 AMPERES.
   INDUCTIVE: 3 AMPERES.

   (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL).
   RESISTIVE: 5 AMPERES.
   INDUCTIVE: 3 AMPERES.

   (3) INRUSH CURRENT: 24 AMPERES.

   C. ENDURANCE: 25,000 CYCLES, MINIMUM.

   D. STRENGTH OF ACTUATOR: 25 POUNDS.

   E. STRENGTH OF TERMINALS: 5 POUNDS.

   F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.

   G. HANDLE: ALUMINUM, DULL SATIN ANODIZE

   H. SENSITIVE SWITCHES: SHALL BE HERMETICALLY SEALED.

   J. VIBRATION: PER ND 1002055, EXCEPT 5-2000 CPS AT 15 G, 0 TO PEAK. DURING VIBRATION THERE SHALL BE NO TRANSFER OF CONTACTS FROM ONE POSITION TO ANOTHER AND NO MOMENTARY OPENING OR CLOSING OF CONTACTS IN EXCESS OF 10 MICROSECONDS.

   K. SHOCK: PER ND 1002055, EXCEPT 78 G HALF SINE WAVE SHOCK INPUT, 11 MILLISECOND PULSE DURATION, NON-OPERATING.

NO PARTS SHALL BREAK LOOSE FROM THE SWITCH ASSEMBLY AND THE SWITCH ASSEMBLY SHALL BE RETAINED IN ITS MOUNTED POSITION. DEFORMATION OF THE SWITCH ASSEMBLY & FAILURE TO OPERATE AFTER SHOCK TESTING ARE ALLOWABLE.

L. LIFE: PER ND 1002055, EXCEPT TEST SHALL CONSIST OF 25,000 ACTUATIONS PERFORMED AT AN ACTUATION CYCLING RATE OF 6 ACTUATIONS PER MINUTE. AFTER LIFE TEST THE SWITCH SHALL BE ELECTRICALLY AND MECHANICALLY FUNCTIONAL AND CONTACT RESISTANCE SHALL BE WITHIN THE LIMITS OF 500 MILLIOHMS MAXIMUM WHEN CHECKED UNDER ACTUAL LIFE TEST LOAD CONDITIONS.

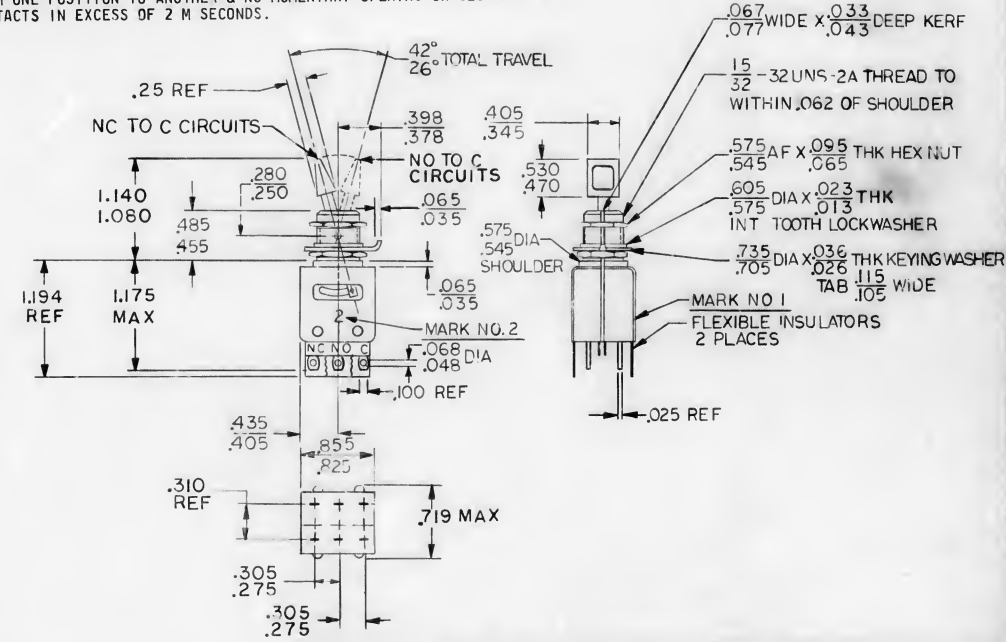
M. AMBIENT PRESSURE RANGE: SEA LEVEL TO 10^{-4} MILLIMETERS OF MERCURY ABSOLUTE.

N. HIGH ALTITUDE OPERATION: SWITCHES SHALL BE CAPABLE OF OPERATION AT AN AMBIENT PRESSURE OF 10^{-4} MM HG ABSOLUTE FOR 4 DAYS.

P. OXYGEN ATMOSPHERE: SWITCH ASSEMBLY SHALL BE CAPABLE OF OPERATING IN AMBIENT ATMOSPHERE OF 100% OXYGEN AT PRESSURES VARYING FROM 10^{-4} MMHG ABSOLUTE TO 15 PSIA WITHOUT CAUSING EXPLOSION OR TOXIC CORROSIVE OUTGRASSING.

R. MATERIALS SHALL NOT EXHIBIT TOXIC OR CORROSIVE OUTGRASSING UNDER ANY OF THE ENVIRONMENTAL CONDITIONS.

S. SHOCK, OPERATING: PER ND 1002055, EXCEPT 50 G'S, 1/2 SINE WAVE SHOCK INPUT, 11 MSEC. PULSE DURATION, OPERATING.DURING OPERATING SHOCK TESTING, THERE SHALL BE NO TRANSFER OF CONTACTS FROM ONE POSITION TO ANOTHER & NO MOMENTARY OPENING OR CLOSING OF CONTACTS IN EXCESS OF 2 M SECONDS.



REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	UPGRADED TO CLASS A PER TDRR 04298	10/30/63	WR
B	REVISED PER TDRR 12311	9/11/64	WR
C	REVISED PER TDRR 15513	12/16/65	WR
D	REVISED PER TDRR 15622	1/26/65	WR

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN Tony Williams DATE 1 APR 63
CHECKED R Bruce A Gilday 30 APR 63
APPROVAL
APPROVAL Elden C Hall 8 May 63
NASA APPROVAL R Mitchell 5/15/63
MIT APPROVAL W Kaffer 15 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

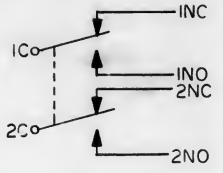
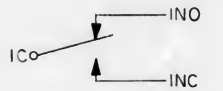
CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006820

SCALE NONE WT SHEET 1 OF 2

1006820

D 0289001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	THIS SHEET ADDED PER TDRR 12311	9/1/64	DG
C	REVISED PER TDRR 15513	1/26/65	WH
D	REVISED PER TDRR 15622	1/28/65	WH

DASH NO.	CONTACT SWITCHING ARRANGEMENT	NO. OF SWITCHES	SCHEMATIC
1006820-000	DOUBLE POLE DOUBLE THROW	2	
1006820-001	SINGLE POLE DOUBLE THROW	1 + 1 (DUMMY)	
1006820-002	SAME AS 1006820-000		BASIC SWITCH SHALL BE PER DWG 1010901
1006820-003	SAME AS 1006820-001		

(B) THIS SHEET ADDED

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG NO. CONTRACT

DRAWN G. RICE DATE 8-28-64
CHECKED A Mantz 8-31-64
APPROVAL G. MA 9/1/64
APPROVAL
NASA APPROVAL 9/1/64
MIT APPROVAL 9/1/64

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SWITCH, TOGGLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006820

SCALE NONE WT SHEET 2 OF 2

D 0289001

1289001

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

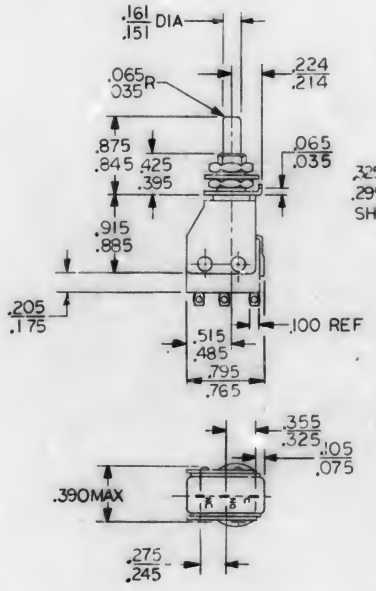
1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
   - B. SWITCHES SHALL BE CAPABLE OF MEETING THE REQUIREMENTS OF MIL-S-6743, EXCEPT AS AND IN ADDITION TO THE REQUIREMENTS SPECIFIED HEREIN.
   - C. SUPPLIERS SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN NC 1015404, CLASS 2.
   - D. UNITS SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002055.
   - E. MARKING: UNITS SHALL BE MARKED PER MIL-STD-130, WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, PART NUMBER, TERMINAL IDENTIFICATION, NASA DRAWING NUMBER AND REVISION LETTER.

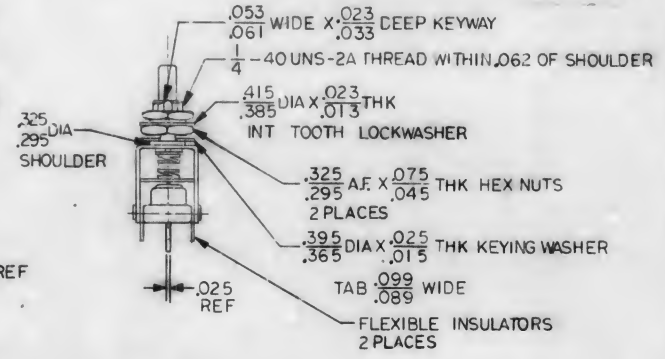
2. ACCEPTANCE AND INSPECTION:
   - A. TERMINALS: SHALL BE PLATED FOR SOLDERING. CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. CONTACT ARRANGEMENT: SINGLE POLE DOUBLE THROW.
   - C. INSULATION: 1000 VOLTS RMS, 60 CYCLES.
   - D. ACTUATING FORCE: 5 ± 1 OUNCES.
   - E. MARKING: PER PARAGRAPH 1 E.

3. DESIGN:
   - A. TEMPERATURE RANGE: -300°F TO +250°F.
   - B. CONTACT RATINGS:
     - (1) 28 VOLTS DC (SEA LEVEL TO 70,000 FEET). RESISTIVE: 5 AMPERES. INDUCTIVE: 3 AMPERES.
     - (2) 125 VOLTS RMS, 400 CYCLES (SEA LEVEL). RESISTIVE: 5 AMPERES. INDUCTIVE: 3 AMPERES.
     - (3) INRUSH CURRENT: 24 AMPERES.
   - C. MINIMUM OPERATING CYCLES: 25,000.
   - D. STRENGTH OF ACTUATOR: 25 POUNDS.
   - E. STRENGTH OF TERMINALS: 5 POUNDS.
   - F. CONTACT VOLTAGE DROP: ONE (1) MILLIVOLT, MAXIMUM AT 100 MILLIAMPERES WHEN 2 TO 4 VOLTS DC IS APPLIED THROUGH A SUITABLE DROPPING RESISTOR.
   - G. SENSITIVE SHITCHES: SHALL BE HERMETICALLY SEALED.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01276 DATE 15 May 63





SYMBOL

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL: SEE NOTES
HEAT TREATMENT: NONE
FINAL FINISH: NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS. DWG. NO. CONTRACT

DRAWN Louis A. Carabetta DATE 5 APR 63
CHECKED A. Bernard D. Yaksey 30 APR 63
APPROVAL
APPROVAL Edwin C. Hall 9 May 63
NASA APPROVAL [signature] 15/May/63
MIT APPROVAL [signature] 15 May 63

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

SWITCH, PUSH

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006821
SCALE NONE	WT	SHEET 1 OF 1

1006821

A 1006827

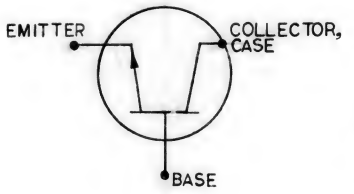
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR 02738	1/21/63	

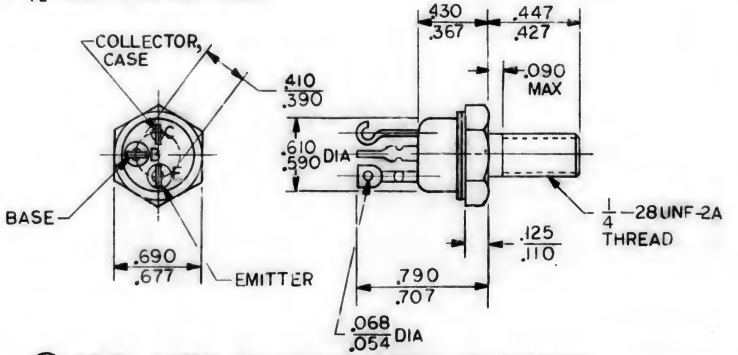
REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. PART SHALL MEET THE APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE ADDITIONS, EXCEPTIONS OR SUBSTITUTIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS PRESCRIBED BY ND 1015404, CLASS 1.
   - D. PART SHALL MEET THE QUALIFICATION REQUIREMENTS OF ND 1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-19491, LEVEL A, IN BOTH INSTANCES. MARKING OF UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE IN ACCORDANCE WITH MIL-P-19471 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER.
   - F. MARKING: MARK EACH PART PER MIL-STD-130 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION, DATE CODE, LOT CODE AND SERIAL NUMBER.
2. ACCEPTANCE AND INSPECTION
   - A. LEAD DATA: PER NASA DOCUMENT 1015402. A CERTIFICATE OF COMPLIANCE FOR THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS: PER TABLE II.
     - (1) BREAKDOWN VOLTAGE; BV_{EBO}, BV_{CBO}, $LV_{CEO}(SUST)$
     - (2) CUTOFF CURRENT; I_{CBO}, I_{CEO}, I_{EBO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO; hFE_1, hFE_4
     - (4) SATURATION VOLTAGE; $V_{CE(sat)_1}$, $V_{BE(sat)_1}$
     - (5) VOLTAGE, BASE-EMITTER, V_{BE}
   - C. MARKING: SEE PARAGRAPH 1F.
3. DESIGN:
   - STORAGE TEMPERATURE (T_{stg}): -65° TO +200°C.
   - JUNCTION OPERATING TEMPERATURE (T_J): +200°C MAXIMUM.
   - ELECTRICAL RATINGS: PER TABLE I.
   - ELECTRICAL CHARACTERISTICS: PER TABLE II.
   - POWER DISSIPATION:
     - AT +100°C CASE TEMPERATURE: 40.0 WATTS.
     - THERMAL RESISTANCE (θ_{JC}): 2.5°C/WATT
4. SPECIAL CONDITIONING (BY SUPPLIER):
   - A. BURN-IN: PARTS SHALL BE BURNED-IN AT THE FOLLOWING CONDITIONS.
     - (1) AMBIENT TEMPERATURE, T_C = +100° ± 5°C.
     - (2) COLLECTOR VOLTAGE, V_{CB} = +60 VOLTS DC, MINIMUM.
     - (3) POWER DISSIPATION: 20 WATTS ± 10 PERCENT (T_J = +150°C)
     - (4) TIME, t = 240 HOURS, MINIMUM.
   - B. THE MANUFACTURER SHALL DETERMINE AND RECORD THE FOLLOWING ELECTRICAL CHARACTERISTICS PRIOR TO AND FOLLOWING BURN-IN:
     - (1) COLLECTOR CUTOFF CURRENT, I_{CBO}
     - (2) EMITTER CUTOFF CURRENT, I_{EBO}
     - (3) COLLECTOR CUTOFF CURRENT, I_{CEX}(+150°C)
     - (4) COLLECTOR SATURATION VOLTAGE, $V_{CE(sat)_2}$
     - (5) STATIC FORWARD CURRENT TRANSFER RATIO, hFE_2
   - C. THE DATA SHALL BE PRESENTED IN A MANNER THAT PROVIDES POSITIVE IDENTIFICATION OF EACH INDIVIDUAL TRANSISTOR WITH THE INITIAL TEST READING, THE FINAL READING AND THE PERCENT CHANGE BETWEEN THE FINAL AND INITIAL READING. THE TEST DATA SUBMITTED SHALL ALSO IDENTIFY PARTS THAT FAIL TO MEET THE SPECIFIED REQUIREMENTS. HISTOGRAMS SHALL BE PLOTTED TO SHOW THE FREQUENCY DISTRIBUTION OF THE ABSOLUTE VALUE OF EACH CHARACTERISTIC AND TO SHOW THE FREQUENCY DISTRIBUTION OF THE PERCENT CHANGE OF EACH CHARACTERISTIC FROM ITS INITIAL READING. UNITS FAILING TO MEET INITIAL DRAWING REQUIREMENTS OR HAVE CHANGED MORE THAN 10% IN h_{FE} SHALL NOT BE ACCEPTABLE.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01275 DATE 15 May 63





PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

A	A
-	-
SHEET 1	SHEET 2
REVISION STATUS OF SHEETS	

Ⓐ REPLACED BY REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE
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APPLICATION

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. | CONTRACT
DRAWN R. Peterson DATE 4 MAY 63
CHECKED W. J. Fifield 4 May 63
APPROVAL
APPROVAL Eldon C. Hall 5-15-63
NASA APPROVAL [signature] 5/15/63
MIT APPROVAL [signature] 5/16/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006827
SCALE NONE	WT	SHEET 1 OF 2

1006827

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REPLACED BY REV B WITH CHANGES PER TDRR 02738	11/21/63	

TABLE I

MANUFACTURER'S ABSOLUTE MAXIMUM RATINGS TC = +25°C					
COLLECTOR CURRENT (I_C)	COLLECTOR VOLTAGE (V_{CB})	EMITTER VOLTAGE (V_{EB})	COLLECTOR VOLTAGE (V_{CE})	COLLECTOR POWER DISSIPATION	MANUFACTURER'S TYPE DESIGNATION
A	V_{DC}	V_{DC}	V_{DC}	W	
10	120	8	80	40	TO BE ASSIGNED

TABLE II

ELECTRICAL CHARACTERISTICS AT TC = +25°C (UNLESS OTHERWISE SPECIFIED)					
PARAMETER	CONDITION	SYMBOL	SPECIFICATION LIMITS MIN	MAX	UNIT
BREAKDOWN VOLTAGE, COLLECTOR-BASE	I_C=10UA, I_E=0	BV_{CBO}	120	-	V_{DC}
BREAKDOWN VOLTAGE, EMITTER-BASE	I_E=10UA, I_C=0	BV_{EBO}	8	-	V_{DC}
BREAKDOWN VOLTAGE, COLLECTOR-EMITTER	I_C=10MA, I_B=0	BV_{CEO}	80	-	V_{DC}
SUSTAINING VOLTAGE, COLLECTOR-EMITTER	I_C=100MA, I_B=0 ▷	LV_{CEO}	70	-	V_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CB}=60V, I_E=0	I_{CBO}	-	100	NA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=60V, V_{BE}=0.5V, T_C=+150°C	I_{CEX}	-	100	UA_{DC}
CUTOFF CURRENT, COLLECTOR	V_{CE}=50V, I_B=0,	I_{CEO}	-	100	UA_{DC}
CUTOFF CURRENT, EMITTER	V_{EB}=8V, I_C=0,	I_{EBO}	-	10	UA_{DC}
STATIC FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=10MA	hFE_1	10	-	-
	V_{CE}=5V, I_C=5A ▷	hFE_2	20	60	-
	V_{CE}=5V, I_C=5A, T_C=-55°C ▷	hFE_3	10	-	-
	V_{CE}=5V, I_C=10A ▷	hFE4	15	-	-
SATURATION VOLTAGE, COLLECTOR-EMITTER	I_C=5A, I_B=500MA. ▷	$V_{CE(sat)_1}$	-	0.5	V_{DC}
	I_C=10A, I_B=1A ▷	$V_{CE(sat)_2}$	-	1.5	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=5A, I_B=500MA ▷	$V_{BE(sat)_1}$	-	1.2	V_{DC}
SATURATION VOLTAGE, BASE-EMITTER	I_C=10A, I_B=1A ▷	$V_{BE(sat)_2}$	-	2.0	V_{DC}
VOLTAGE, BASE-EMITTER	V_{CE}=5V, I_C=5A ▷	V_{BE}	-	1.2	V_{DC}
SMALL-SIGNAL, SHORT-CIRCUIT, FORWARD CURRENT TRANSFER RATIO	V_{CE}=5V, I_C=50MA, f=1KC	hfe	20	75	-
	V_{CE}=10V, I_C=1A, f=10MC	|hfe|	1.5	-	-
OUTPUT CAPACITANCE	V_{CB}=10V, I_C=0, f=1MC	Cob	-	350	pf

▷ PULSE CONDITIONS: WIDTH ≤ 330 MICROSECONDS; DUTY CYCLE ≤ 2%.

FOR INFORMATION ONLY

CLASS B RELEASE TDR No. 01275 DATE 15 May 63

Ⓐ REPLACED BY REV B WITH CHANGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT NONE
FINAL FINISH NONE

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN J Runnion DATE 4 MAY 63
CHECKED W. J. Gifford Mgr. Eng. 6 MAY 63
APPROVAL
APPROVAL Elden C Hall 5-15-63
NASA APPROVAL [illegible] 5/15/63
MIT APPROVAL W Kupfer 15 May 63

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TRANSISTOR, NPN, SILICON, POWER
SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006827
SCALE NONE	WT	SHEET 2 OF 2

1006827

1006827

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
B	REPLACES REV A WITH CHANGES AND UPGRADED TO CLASS A PER TDRR 02738 W. Maynard	12/1/63	Dry
C	REVISED PER TDRR 04907	12/10/63	PPC DHO
D	REVISED PER TDRR 05283	27 Dec 63	WHK.

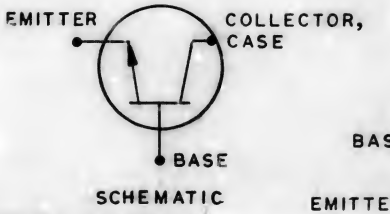
NOTES:

1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. THE PART SHALL MEET APPLICABLE REQUIREMENTS OF MIL-S-19500 WITH THE EXCEPTIONS AND ADDITIONS SPECIFIED HEREIN.
   - C. THE SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 2.
   - D. THE PART SHALL BE CAPABLE OF MEETING QUALIFICATION REQUIREMENTS OF ND1002051.
   - E. PACKAGING AND PACKING: UNIT PACKAGING AND PACKING SHALL BE IN ACCORDANCE WITH MIL-P-[illegible]9491, LEVEL A, IN BOTH INSTANCES.
2. ACCEPTANCE AND INSPECTION:
   - A. LEAD MATERIAL: IRON-NICKEL-COBALT ALLOY (KOVAR) IN ACCORDANCE WITH ND 1015402. EXCEPT FOR DIMENSIONS A CERTIFICATE OF COMPLIANCE WITH THIS REQUIREMENT SHALL ACCOMPANY EACH SHIPMENT.
   - B. DIMENSIONS: AS SPECIFIED HEREIN. SAMPLE SHALL BE IN ACCORDANCE WITH MIL-STD-105C, INSPECTION LEVEL I, AQL OF 4.0 PERCENT.
   - C. ELECTRICAL CHARACTERISTICS: AS SPECIFIED IN TABLE I. THE FOLLOWING CHARACTERISTICS SHALL BE INSPECTED ON 100 PERCENT OF UNITS PROCURED.
     - (1) BREAKDOWN VOLTAGE: BV_{EBO}, BV_{CBC}, $LV_{CEO(SUST)}$
     - (2) CUTOFF CURRENT: I_{CBO}, I_{CEO}
     - (3) STATIC FORWARD CURRENT TRANSFER RATIO: hFE_2, hFE_4
     - (4) SATURATION VOLTAGE: $V_{CE(SAT)_1}$, $V_{BE(SAT)_1}$
   - D. MARKING: SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
     - (1) UNITS SHALL BE MARKED PER MIL-STD-130 WITH THE NASA DRAWING NUMBER AND REVISION LETTER, MANUFACTURER'S NAME AND/OR SYMBOL, TYPE DESIGNATION AND LOT IDENTIFICATION.
     - (2) UNIT PACKAGES AND EXTERIOR SHIPPING CONTAINERS SHALL BE MARKED PER MIL-STD-129 AND SHALL INCLUDE THE NASA DRAWING NUMBER AND REVISION LETTER, THE MANUFACTURER'S NAME, LOT NUMBER AND DATE OF MANUFACTURE.
   - E. EACH UNIT SHALL BE SUPPLIED WITH THE FOLLOWING HARDWARE: ONE NICKEL PLATED BRASS HEXAGON NUT, ONE MICA WASHER AND ONE PLASTIC BUSHING. HARDWARE CONFIGURATION SHALL BE AS SHOWN HEREIN. SAMPLE PER MIL-STD-105C, LEVEL I, AQL OF 4.0 PERCENT.
3. DESIGN:
   - A. ABSOLUTE MAXIMUM RATINGS:
     - (1) STORAGE TEMPERATURE (Tstg): FROM MINUS 65 DEGREES CENTIGRADE TO PLUS 200 DEGREES CENTIGRADE.
     - (2) JUNCTION OPERATING TEMPERATURE (T_J): PLUS 200 DEGREES CENTIGRADE.
     - (3) POWER DISSIPATION:
       - (a) AT PLUS 100 DEGREES CENTIGRADE CASE TEMPERATURE: 40.0 WATTS.
       - (b) THERMAL RESISTANCE (θ_{JC}): 2.5 DEGREES CENTIGRADE PER WATT.
     - (4) COLLECTOR TO EMITTER VOLTAGE (V_{CE}): 80 VOLTS DC.
     - (5) BASE TO EMITTER VOLTAGE (V_{BE}): 8 VOLTS DC.
     - (6) COLLECTOR TO BASE VOLTAGE(V_{CB}): 120 VOLTS DC.
     - (7) COLLECTOR CURRENT (I_C): 10 AMPERES.
   - B. MOUNTING: STUD SHALL BE CAPABLE OF WITHSTANDING A TORQUE OF 12 INCH-POUNDS MAXIMUM.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

MASTER

(B) REPLACES REV A WITH CHANGES



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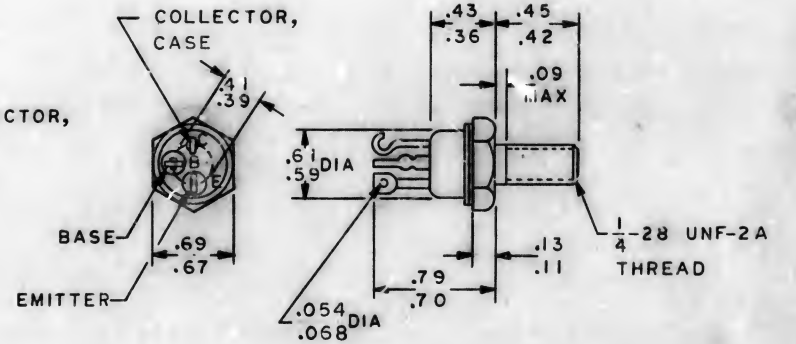

D	B
C	B
B	B
SHEET 1	SHEET 2

REVISION STATUS OF SHEETS

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
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MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN C. Campi DATE 8 Aug 63
CHECKED J. Raggazzini / W. Maynard
APPROVAL
APPPOVAL Eldon C. Hall 8 Aug 63
NASA APPROVAL 12/2/1963
MIT APPROVAL D. Wolf 12/2/63

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TRANSISTOR, NPN, SILICON, POWER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006827
SCALE NONE	WT	SHEET 1 OF 2

1006834

REVISIONS TDRR 01451			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-STD-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.
   - C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE.
2. ACCEPTANCE AND INSPECTION:
   - A. PROPERTIES:
     - (1) COLOR - WHITE TO CREAM.
     - (2) VISCOSITY AT 77°F - 50,000 CENTISTOKES.
     - (3) SPECIFIC GRAVITY AT 77°F - 1.13
3. DESIGN:
   - A. SHALL BE DESIGNED TO HAVE THE FOLLOWING PROPERTIES AFTER BEING CATALYZED WITH STANNOUS OCTOATE.
     - (1) HARDNESS - DUROMETER SHORE A, ASTM D676: 35 MINIMUM.
     - (2) TENSILE STRENGTH, PSI, ASTM D412: 300 MINIMUM.
     - (3) ELONGATION PERCENT ASTM D412: 100 MINIMUM.
     - (4) DIELECTRIC STRENGTH, VOLTS PER MIL (1/16 INCH THICK SPECIMEN) ASTM D149: 550 TYPICAL, 450 MINIMUM.
   - B. STORAGE AND SHELF LIFE: SHOULD BE STORED AT TEMPERATURES BELOW 70 DEGREES F. THE AS RECEIVED MATERIAL WHEN STORED UNDER THESE CONDITIONS SHALL HAVE A SHELF LIFE OF AT LEAST FOUR (4) MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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NEXT ASSY	USED ON
APPLICATION	

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MATERIAL: SEE NOTES
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MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN R.D. Rowland DATE 6 May 63
CHECKED J. Benjamin H. Maynard 17 MAY 63
APPRCVAL A.C. Smith 5-31-63
APPROVAL

NASA APPROVAL W. J. Thaine 6-5-63
MIT APPROVAL L. Wolfe 6/5/63

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COMPOUND, SILICONE RUBBER

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006834

SCALE NONE WT SHEET 1 OF 1

1006835

REVISIONS TDRR 01451			
SYM	DESCRIPTION	DATE	APPROVAL

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS CONTAINED IN ND 1015404, CLASS 3.

   C. MARKING: THE CONTAINER SHALL BE MARKED IN ACCORDANCE WITH MIL-STD-129 WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, IDENTIFYING NUMBER, ITEM NAME, NASA DRAWING NUMBER, REVISION LETTER AND DATE OF MANUFACTURE.

2. DESIGN:

   A. MATERIAL: STANNOUS OCTOATE - TIN OCTOATE WITH STANNOUS TIN CONCENTRATE OF 28 PERCENT.

   B. CAPABILITIES: THIS MATERIAL SHALL BE SUITABLE FOR USE AS A CURING AGENT FOR EPOXY RESIN.

   C. SHELF LIFE: WHEN STORED AT 70°F THE AS PURCHASED MATERIAL SHALL HAVE A SHELF LIFE OF NOT LESS THAN 4 MONTHS.

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
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DO NOT SCALE THIS DRAWING
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MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT

DRAWN Ray Wolfe DATE 17 May 63
CHECKED J. Meyer for M. Mayfield
APPROVAL A.C. Smith 5-31-63
APPROVAL
NASA APPROVAL W J Rhine 6-5-63
MIT APPROVAL L Hazel 6/5/63

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STANNOUS OCTOATE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006835
SCALE NONE	WT	SHEET 1 OF 1

1006835

B 1006846

REVISIONS 02821			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 03037	10Sept63	GVL
B	REVISED PER TDRR 04188	10-24-63	GVL

NOTES:

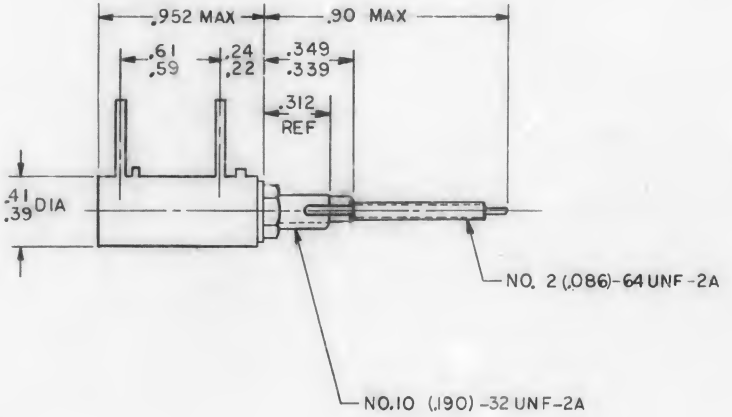
1. GENERAL REQUIREMENTS:
   - A. INTERPRET DRAWING IN ACCORDANCE WITH THE STANDARDS PRESCRIBED BY MIL-D-70327.
   - B. UNITS SHALL CONFORM TO THE REQUIREMENTS OF MIL-C-15305, TYPE LT4K GRADE 1, CLASS B AS MODIFIED BY THE REQUIREMENTS OF THIS DRAWING.
   - C. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 2.
   - D UNITS SHALL BE CAPABLE OF MEETING THE QUALIFICATION REQUIREMENTS OF ND1002060
   - E. UNITS SHALL BE PERMANENTLY AND LEGIBLY MARKED, PER MIL-STD-130, WITH THE INDUCTANCE VALUE RANGE, DC RESISTANCE, AND NASA PART NUMBER (DRAWING NUMBER AND REVISION LETTER). PACKAGES SHALL BE MARKED PER MIL-STD-129, INTERNALLY AND EXTERNALLY WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, LOT CODE NUMBER, AND THE NASA PART NUMBER OTHER MARKING BEING PERMISSIBLE.
2. ACCEPTANCE AND INSPECTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) TUNING TORQUE: BETWEEN 0.4- 9.0 OUNCE-INCHES STARTING AND PREVAILING.
     - (2) LEAD MATERIAL: WELDABLE, FLEXIBLE, GOLD PLATED, IRON-NICKEL ALLOY (DUMET) PER 1015401. MATERIAL SHALL BE CERTIFIED WITH EACH SHIPMENT.
   - B. ELECTRICAL CHARACTERISTICS:
     - (1) INDUCTANCE TUNING RANGE: FROM 8 MICROHENRIES TO 13 MICROHENRIES AT 2.5 MEGACYCLES.
     - (2) Q FACTOR: 80 MINIMUM OVER THE ENTIRE RANGE.
     - (3) DC RESISTANCE: 1.4 OHMS MAX.
     - (4) INDUCTANCE - TEMPERATURE COEFFICIENT: ± 50 PPM FROM 0°C TO +70°C.
3. DESIGN REQUIREMENTS:
   - A. OPERATING LIFE: 2000 HOURS MINIMUM AT MAXIMUM CURRENT AND TEMPERATURE RATINGS. THE ADJUSTMENT SCREW SHALL BE CAPABLE OF 500 CYCLES OF OPERATION. ONE CYCLE EQUALS ADJUSTMENT ALL THE WAY IN AND ALL THE WAY OUT.
   - B. CONSTRUCTION: SCREW THREAD BUSHING FOR MOUNTING WITH A PREVAILING TORQUE TYPE OF LOCK FOR TUNING SLUG. BODY OF THE COIL IS ENCAPSULATED IN EPOXY.
   - C. OPERATING TEMPERATURE RANGE: 0°C TO +70°C.
   - D. CURRENT RATING (MAXIMUM): 450 MILLIAMPERES.
   - E. LEAD FATIGUE (EACH LEAD SHALL BE CAPABLE OF MEETING THE PULL AND BEND TEST, HOWEVER THE SAME LEAD SHALL NOT BE TESTED FOR BOTH.

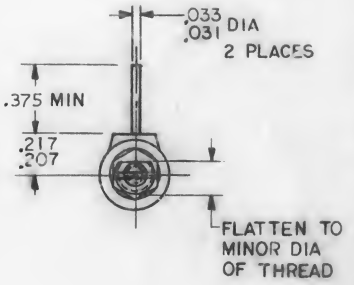
     PULL TEST: AN AXIAL PULL OF FOUR (4) POUNDS MINIMUM.

     BEND TEST: (DESTRUCTIVE): HOLD THE COMPONENT IN SUCH A MANNER THAT A TWO (2) POUND WEIGHT MAY BE SUSPENDED IN AN AXIAL DIRECTION FROM THE LEAD UNDER TEST. THE BEND CYCLE (ONE (1) CYCLE REQUIRED) SHALL BE ACCOMPLISHED BY MOVING THE BODY OF THE UNIT, WHILE IN THE SAME PLANE, THROUGH 90° IN ONE DIRECTION, THEN BACK 180° IN THE OPPOSITE DIRECTION AND BACK 90° TO THE ORIGINAL POSITION. NO MECHANICAL DAMAGE OR LACK OF PERFORMANCE SHALL BE EVIDENCED AFTER THE TEST.

4. SPECIAL CONDITIONING:
   - A. TEMPERATURE CYCLING TEST: FIVE (5) CYCLES OF 125°C FOR 30 MIN., 25°C FOR 15 MIN., -55°C FOR 30 MIN., AND 25°C FOR 15 MIN. MONITOR THE DC RESISTANCE BEFORE THE FIRST CYCLE, AFTER THE FOURTH CYCLE, AND AFTER THE FIFTH CYCLE. ANY UNIT THAT DEVIATES MORE THAN 4% BETWEEN THE INITIAL MEASUREMENTS AND THAT OF THE FOURTH, OR MORE THAN 2% BETWEEN THE FOURTH AND THE FIFTH, SHALL BE REJECTED. ALL MEASUREMENTS SHALL BE TAKEN WITH THE UNIT AT ROOM TEMPERATURE.

     A CERTIFICATE OF COMPLIANCE WITH THIS TEST MUST ACCOMPANY EACH LOT SHIPPED.





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QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NEXT ASSY	USED ON
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UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
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FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTES
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO. CONTRACT
DRAWN H Bennie 9MA DATE 28 JUNE63
CHECKED A J Mgr 28 June 63
APPROVAL E P Russell 23 Aug 63
APPROVAL Ellen C Hall 23Aug63
NASA APPROVAL Jack Bennett
MIT APPROVAL R Hafstad 9/10/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COIL, RF, VARIABLE

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1006846

SCALE NONE WT SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED

NOTES:

1. GENERAL REQUIREMENTS:
   - A. ELECTRICAL CHARACTERISTICS:
     - (1) DC RESISTANCE (OHMS/1000 FT.): 1.24 MAXIMUM.
     - (2) SPARK TEST: 5.0 KILOVOLTS.
     - (3) DIELECTRIC STRENGTH: 3.0 KILOVOLTS MINIMUM.
     - (4) INSULATION RESISTANCE: 5000 MEGOHMS/1000 FEET, MINIMUM.
     - (5) DIELECTRIC CONSTANT: 2.2 MAXIMUM.
     - (6) POWER FACTOR AT 60 CPS: 0.005 MAXIMUM.
     - (7) SURFACE RESISTANCE: 5 MEGOHMS MINIMUM.
     - (8) VOLTAGE RATING: 1000 VRMS.
   - B. OPERATING TEMPERATURE RANGE: -65°C TO +200°C.
   - C. MARKING PER MIL-STD-129 FOR REELS AND SHIPPING CONTAINERS SHALL INCLUDE THE ITEM DESCRIPTION, COLOR, MANUFACTURER'S NAME AND/OR SYMBOL, AND NASA DRAWING NUMBER PLUS REVISION LETTER.
2. CONSTRUCTION REQUIREMENTS:
   - A. MECHANICAL PROPERTIES:
     - (1) MATERIAL: SILVER PLATED COPPER CONDUCTOR WITH AN INSULATION OF POLYTETRAFLUOROETHYLENE (TFE).
     - (2) COLOR, INSULATION: GREY - INDIVIDUAL CONDUCTORS STRIPED BLACK, BROWN, RED, AND ORANGE. MIL-STD-104 FOR COLOR LIMITS.
   - B. CONSTRUCTION:
     - (1) EACH CONDUCTOR: NO. 10 AWG STRANDED CONDUCTOR, TEFLON INSULATED IN ACCORDANCE WITH MIL-W-16878/5.
     - (2) CABLE: FOUR CONDUCTORS TWISTED AND COVERED WITH WRAPPED TEFLON TAPE. OUTSIDE DIAMETER TO BE .400 MAXIMUM.
3. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS CONTAINED IN ND 1015404, CLASS 3.

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01894 DATE 5/29/63

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL **SEE NOTES**
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN Ray Wheeler DATE 27 Apr 63
CHECKED R. Reggeri 1 May 63
APPROVAL C. Sterling QR
APPROVAL G. DeDumpy 12 May 63
APPROVAL L. Spitzer 5/11/63
NASA APPROVAL Jack Barnard
MIT APPROVAL Reggeri 5/29/63
MIT APPROVAL W. Hopper 29 May 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CABLE, POWER, ELECTRICAL— 4 CONDUCTOR

SPECIFICATION CONTROL DRAWING

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1006885
SCALE NONE	WT	SHEET 1 OF 1

1006885

D 1011625

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 14277	11-12-64	
B	REVISED PER TDRR 16133	2/26/65	
C	REVISED PER TDRR 17172	8/[illegible]/65	
D	REVISED PER TDRR 32814	6APR67	

REQUIREMENTS:

1. GENERAL:

   A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

   B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 101504, CLASS 3.

   C. SCREWS SHALL BE MANUFACTURED IN ACCORDANCE WITH FEDERAL SPEC. FF-S-86; TYPE VI, NAS 1352 (FOR COARSE THREAD SERIES) AND NAS 1351 (FOR FINE THREAD SERIES)

2. INSPECTION AND ACCEPTANCE:

   A. PACKAGES AND SHIPPING CONTAINERS SHALL BE MARKED WITH NASA DRAWING NUMBER, REVISION LETTER, DASH NUMBER, AND MANUFACTURER'S PART NUMBER PER MIL-STD-129.

   B. DIMENSIONS AS SHOWN. NOTE THAT DIMENSIONS ARE IDENTICAL WITH NAS '351 , NAS 1352 EXCEPT FOR LENGTHS.

   C. THREAD LENGTH (L_t) SCREWS HAVING A LENGTH LESS THAN THE MINIMUM BASIC THREAD LENGTH, SHALL BE THREADED AS CLOSE TO THE HEAD AS PRACTICABLE.

   D. LOCKING LENGTH (M) - MINIMUM OF FIVE (5) THREAD PITCHES. REGION OF MINIMUM ENGAGEMENT WITH FULL FEMALE THREAD REQUIRED TO MEET MIL-F-18240 REQUIREMENTS. LOCKING ELEMENT WITHIN "M" REGION MUST DEVELOP REQUIRED TORQUE WHEN TESTED IN ACCORDANCE WITH MIL-F-18240. LENGTH OF LOCKING ELEMENT MAY BE MORE OR LESS THAN "M" PROVIDING ALL OTHER REQUIREMENTS ARE MET.

   E. LENGTH OF POINT LEAD (N) - ONE (1) COMPLETE THREAD PLUS UNTHREADED PORTION OF END. FOR EASE OF STARTING, LOCKING ELEMENT SHALL NOT BE EFFECTIVE WITHIN THIS AREA.

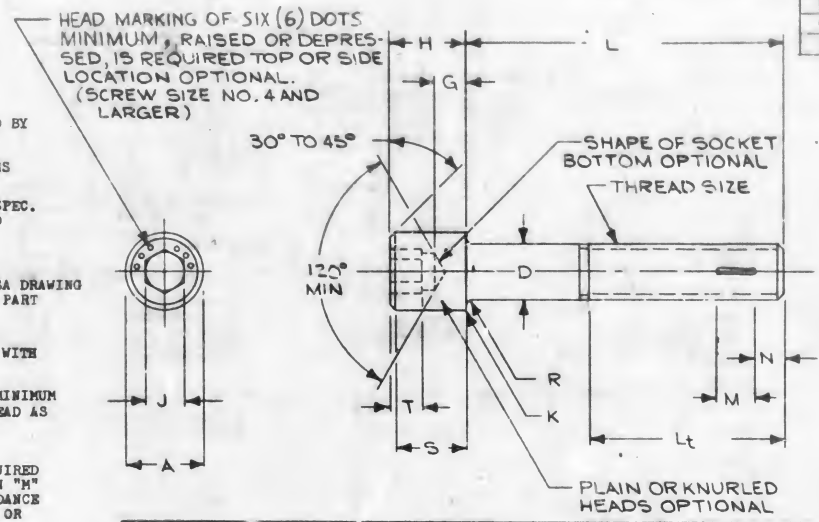
3. DESIGN REQUIREMENTS:

   A. SELF-LOCKING ELEMENT SHALL BE STRIP TYPE IN ACCORDANCE WITH MIL-F-18240.

   B. MATERIAL: CRES IN ACCORDANCE WITH FF-S-86.

   C. FINISH: PASSIVATE IN ACCORDANCE WITH FF-S-86

PROCURE ONLY FROM APPROVED SOURCES LISTED IN ND 1002034 FOR THIS DRAWING.



THREAD SIZE	D BODY DIAMETER MAX	D BODY DIAMETER MIN	A HEAD DIAMETER MAX	A HEAD DIAMETER MIN	H HEAD HEIGHT MAX	H HEAD HEIGHT MIN	S HEAD SIDE HEIGHT MIN	J SOCKET SIZE MAX	J SOCKET SIZE MIN	T KEY ENGAGEMENT MIN	G WALL THICKNESS MIN	R RADIUS OF FILLET UNDER HEAD MAX	R RADIUS OF FILLET UNDER HEAD MIN	K CHAMFER OR RADIUS MAX	Lt MINIMUM BASIC THREAD LENGTH	MINIMUM BREAKING STRENGTH (POUNDS) CORROSION RESISTING STEEL
NO. 1-64UNC-3A	.073	.0695	.118	.112	.073	.070	.066	.0635	.0625	.031	.023	.007	.003	.003	.625	210
NO. 2-56UNC-3A	.086	.0822	.140	.134	.086	.083	.077	.0791	.0781	.038	.028	.008	.004			300
NO. 3-48UNC-3A	.099	.0949	.161	.154	.099	.095	.089			.044	.032					390
NO. 4-40UNC-3A	.112	.1075	.183	.176	.112	.108	.101	.0952	.0937	.051	.036	.009	.005	.005	.750	480
NO. 6-32UNC-3A	.138	.1329	.226	.218	.138	.134	.124	.1111	.1094	.064	.044	.010	.006			730
NO. 8-32UNC-3A	.164	.1585	.270	.262	.164	.159	.148	.1426	.1406	.077	.052	.012	.007		.875	1120
NO.10-24UNC-3A	.190	.1840	.312	.303	.190	.185	.171	.1587	.1562	.090	.061	.014	.009			1400
NO.10-32UNF-3A																1600
1/4-28UNF-3A	.250	.2435	.375	.365	.250	.244	.225	.1900	.1875	.120	.080			.008	1.000	2910

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

KIC PN 74455151001-1096

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 3
HEAT TREATMENT —
FINAL FINISH —

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS.
DWG. NO | CONTRACT
DRAWN MARINELLI DATE 8-1-63
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER, HOUSTON, TEXAS

SCREW, CAP, HEX SOC HD SELF LOCKING (SPEC CONTROL DWG)

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1011625
SCALE | WT | SHEET 1 OF 2

1011625 D4

D 1011625

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 14077	11-12-62	WK
B	REVISED PER TDRR 16133	3/5/63	WK
C	REVISED PER TDRR 17172	4/4/65	WK
D	REVISION STATUS CHANGED	4 APR 67	GJM E.F.S

L LENGTH	TOL	THREAD SIZE & DASH NO.								
		1-64 UNC-3A	2-56 UNC-3A	3-48 UNC-3A	4-40 UNC-3A	6-32 UNC-3A	8-32 UNC-3A	10-24 UNC-3A	10-32 UNF-3A	1/4-28 UNF-3A
.125			-8		-25					
.188			-9	-16	-26					
.250				-17				-66		
.313		-4	-11	-18	-28	-39	-51	-67		
.375										
.438		-6	-13	-20	-30	-41	-53	-68		-85
.500	±.015	-7								
.563			-15	-22	-32	-43	-55		-70	-87
.625										
.688				-24	-34	-45	-57		-72	-89
.750				-96						
.813					-36	-47	-59		-74	-91
.875					-37					
.938						-49	-61		-76	-93
1.000										
1.125	+.030 -.015						-63		-78	-95
1.250										

REFERENCE ONLY

NASA DASH NO.	KIC DASH NO.	NASA DASH NO.	KIC DASH NO.	NASA DASH NO.	KIC DASH NO.	NASA DASH NO.	KIC DASH NO.
- 4	1004	-25	1025	-47	1048	-70	1071
- 6	1006	-26	1026	-49	1050	-72	1073
- 7	1007	-28	1028	-51	1052	-74	1075
- 8	1008	-30	1030	-53	1054	-76	1077
-11	1011	-32	1032	-55	1056	-78	1079
-13	1013	-34	1034	-57	1058	-85	1085
-15	1015	-36	1036	-59	1060	-87	1087
-16	1016	-37	1037	-61	1062	-89	1089
-18	1018	-39	1040	-63	1064	-91	1091
-20	1020	-41	1042	-66	1067	-93	1093
-22	1022	-43	1044	-67	1068	-95	1095
-24	1024	-45	1046	-68	1069	-96	

KIC PART NO
74455151001-1096

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS
DWG NO CONTRACT

DRAWN MARINELLI DATE 8-21-63
CHECKED [signature] 8/21/63
APPROVAL [signature illegible] 8/30/63
APPROVAL E. Thorp 8/30/63
NASA APPROVAL [signature] 9/4/63
MIT APPROVAL [signature] 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCREW, CAP, HEX SOC HD SELF LOCKING (SPEC CONTROL DWG)

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1011625
SCALE ~	WT	SHEET 2 OF 2

1011625 D

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
(4)	-	INITIAL RELEASE CLASS A PER TDRR 13135			9-30-64	WK
A		REVISED PER TDRR 16603			2/24/65	WK

REQUIREMENTS

1. GENERAL
   - A. INTERPRET DRAWING IN ACCORDANCE WITH MIL-D-70327.
   - B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS SPECIFIED IN ND 1015404, CLASS 3.
   - C. PRESERVATION, PACKAGING, PACKING AND SHIPPING SHALL BE IN ACCORDANCE WITH MIL-P-3131, LEVEL A.
   - D. TAPE SHALL BE WOUND ON SPOOL OR ROLLS OF 250 YARDS IN ACCORDANCE WITH MIL-T-713.
2. INSPECTION AND ACCEPTANCE
   - A. PACKAGE AND SHIPPING CONTAINER SHALL BE MARKED WITH NASA DRAWING NUMBER, REVISION LETTER, MANUFACTURER'S PRODUCT IDENTIFICATION AND ESTIMATED SHELF LIFE IN ACCORDANCE WITH MIL-STD-129.
   - B. TAPE WIDTH: PER TABLE I
     TAPE THICKNESS: PER TABLE I
   - C. COLOR: PER TABLE I
   - D. BREAKING STRENGTH: PER TABLE I, TESTED IN ACCORDANCE WITH METHOD 4102 OF FEDERAL SPECIFICATION CCC-T-191.
3. DESIGN REQUIREMENTS
   - A. MATERIAL: POLYESTER FIBERS, BRAIDED, FLAT
   - B. FINISH: RUBBER, SYNTHETIC (STYRENE BUTADIENE) NON-FLAKING, NON-CORROSIVE
   - C. FUNGUS RESISTANCE SHALL BE IN ACCORDANCE WITH MIL-T-713 EXCEPT THE TYPE OF TAPE TESTED SHALL BE THE TAPE SPECIFIED ON THIS DRAWING.
   - D. WORKMANSHIP SHALL BE IN CONFORMITY WITH MIL-T-713.

VENDOR: GUDEBROD BROS. SILK CO., INC.
12 SOUTH 12TH STREET
PHILADELPHIA 7, PA.

PART NO: SEE TABLE I

TABLE I

DASH NO.	COLOR	WIDTH	THICKNESS	STRENGTH LBS.MIN.	VENDOR PART NO.
001	NATURAL (WHITE)	.050±.008	.008±.003	15	21D96 (NATURAL)
002	BLACK	.050±.008	.008±.003	15	21D96 (BLACK)
003	NATURAL (WHITE)	.090±.014	.0125±.0030	50	18D96 (NATURAL)
004	BLACK	.090±.014	.0125±.0030	50	18D96 (BLACK)
005	BLACK	.120±.018	.014±.003	80	23D96 (BLACK)
006	NATURAL (WHITE)	.062±.008	.0115±.0030	32	22D96 (NATURAL)
007	BLACK	.062±.008	.0115±.0030	32	22D96 BLACK

PROCURE ONLY FROM APPROVED SOURCES
LISTED ON ND 1002034 FOR THIS DRAWING

KIC 6003516600I
NO THRU 6004

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 3A

NEXT ASSY	USED ON
APPLICATION	

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN M D MENZORIO 8 JUL 64
CHECKED A. Cudlo 25 AUG 64
APPROVED
APPROVED E. Thorup
APPROVED MIT W. Cuyler 30 Sept 64
APPROVED MSC [signature] 9/30/64
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

TAPE, LACING AND TYING

SOURCE CONTROL DWG

CODE IDENT NO.	SIZE	DRAWING NO.
	C	1012507

SCALE

SHEET 1 OF 1

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22338			9-8-65	
A		REVISED PER TDRR 25206			1/18/66	
B		REVISED PER TDRR 28066			4/20/66	
C		REVISED PER TDRR 28746			5-17-66	

REQUIREMENTS

1. GENERAL

A. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.

B. SUPPLIER SHALL CONFORM TO THE QUALITY ASSURANCE PROVISIONS AS SPECIFIED IN ND 1015404, CLASS 3.

C. EACH SHIPPING AND UNIT CONTAINER SHALL BE PERMANENTLY AND LEGIBLY MARKED WITH THE MANUFACTURER'S NAME AND/OR SYMBOL, ITEM NAME NASA DRAWING NUMBER, DASH NUMBER AND REVISION LETTER, NET CONTENTS, LOT NUMBER, DATE OF MANUFACTURE AND EXPIRATION DATE FOR THE MATERIAL WHEN STORED AT A TEMPERATURE BELOW 100°F IN CLOSED CONTAINERS, AND MIXING RATIOS.

2. ACCEPTANCE AND INSPECTION

A. COMPOSITION: THE COATING MATERIAL SHALL CONSIST OF THE FOLLOWING TWO COMPONENTS PACKAGED SEPARATELY AND SUPPLIED IN A TWO-CONTAINER KIT OF THE CORRECT MIXTURE RATIO BY VOLUME (THREE PARTS COMPONENT NO. 1 AND ONE PART COMPONENT NO. 2).

1. COMPONENT NO. 1: POLYESTER RESIN BASE COMPOUNDED WITH COLOR, EXTENDER, INERT PIGMENTS, AND NECESSARY ADDITIVES AND SOLVENTS.

2. COMPONENT NO. 2: CONVERTER (CATALYST) RESIN SOLUTION WITH SUITABLE SOLVENTS.

B. COLOR OF MIXED COATING: THE COLORS SHALL BE AS SPECIFIED IN TABLE I. COLORS SHALL CONFORM TO THE COLOR NUMBERS OF FEDERAL STANDARD 595 AS SPECIFIED IN TABLE I WHEN TESTED TO METHOD 4250 OF FEDERAL TEST METHOD STANDARD NUMBER 141 EXCEPT THAT ONLY THE ITEMS DESCRIBED ON THIS DRAWING WHEN PROCURRED FROM THE VENDOR LISTED HEREON ARE APPROVED BY MIT/IL. A SUBSTITUTE ITEM SHALL NOT BE USED WITHOUT PRIOR TESTING AND APPROVAL BY MIT/IL. THE COLOR OF THE BLACK COATING MAY BE BLACKER THAN THE FED-STD-595 AND THE COLOR OF THE WHITE COATING MAY BE WHITER THAN THE FED-STD-595

C. VISCOSITY:

1. COMPONENT NUMBER 1: 50 SECONDS, MAXIMUM, ZAHN CUP NO. 5

2. COMPONENT NUMBER 2: 20 SECONDS, MAXIMUM, ZAHN CUP NO. 2

3. MIXED COATING: 34 SECONDS, MAXIMUM, ZAHN CUP NO. 3

D. WEIGHT (METHOD 4184OF FEDERAL TEST METHOD STANDARD NO. 141)

1. COMPONENT NUMBER 1: WEIGHT SHALL BE AS SPECIFIED IN TABLE 1

2. COMPONENT NUMBER 2: 9.22 ± 0.2 POUNDS PER GALLON

3. MIXED COATING: WEIGHT SHALL BE AS SPECIFIED IN TABLE 1

E. CONDITION IN CONTAINERS:

1. COMPONENT NO. 1 SHALL NOT SETTLE, SEPARATE, CAKE NOR THICKEN TO A DEGREE THAT IT CANNOT BE EASILY REDISPERSED BY STIRRING WHEN TESTED PER METHOD 3011 OF FEDERAL TEST METHOD STANDARD NO. 141.

2. COMPONENT NO. 2 SHALL NOT THICKEN IN THE CONTAINER.

3. DESIGN REQUIREMENTS (ALL TEST METHODS PER FEDERAL TEST METHOD STANDARD NUMBER 141 UNLESS OTHERWISE SPECIFIED)

A. PHYSICAL REQUIREMENTS (QUANTITATIVE):

1. SOLIDS (METHOD 4041):

A. COMPONENT NUMBER 1: SOLIDS CONTENT SHALL BE AS SPECIFIED IN TABLE 1

MASTER

APPROVED SOURCE OF SUPPLY

REFLECTIVE PRODUCTS DIVISION
MINNESOTA MINING AND MANUFACTURING CO.
ST. PAUL, MINNESOTA

TABLE 1

NASA DASH NO.	KIC DASH NO.	SOURCE OF SUPPLIER'S PRODUCT DESIGNATION
001	2001	401-C10
002	2002	401-A10
003	2003	401-B2

NEXT ASSY	USED ON
APPLICATION	

KIC 7447148001 NO. THRU 2003

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN M. MENZORIO 8-20-65
CHECKED 20AUG65
APPROVED
APPROVED E. Thorup 9/8/65

COATING KIT, LIGHT-DIFFUSING, SOURCE CONTROL DWG

APPROVED MIT NOT REQUIRED PER LETTER
APPROVED NASA PP7-65-612 DATE

CODE IDENT NO. 80230 | SIZE C | DRAWING NO. 1012543

SCALE | SHEET 1 OF 4

1012543 C

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22338			9-8-65	
A		REVISED PER TDRR 25206			1/18/66	
B		REVISED PER TDRR 28066			4/12/66	
C		REVISED PER TDRR 28746	DOC		5-17-66	

B. COMPONENT NUMBER 2: 40 ± 2 PERCENT BY WEIGHT

C. MIXED COATING: SOLIDS CONTENT SHALL BE AS SPECIFIED IN TABLE I

2. PIGMENT IN MIXED COATING (METHOD 4021): 30 PERCENT BY WEIGHT, MINIMUM

3. RESIN SOLIDS IN MIXED COATING (METHOD 4041): 15 PERCENT BY WEIGHT, MINIMUM

4. FINENESS OF GRIND (METHOD 4411):

A. COMPONENT NUMBER 1: 3, MINIMUM

B. MIXED COATING: 3, MINIMUM

B. DRYING REQUIRMENTS OF MIXED COATING:

1. AIR-DRY AT 77 ± 2° F (METHOD 4061)

A. SET-TO-TOUCH: 20 MINUTES, MAXIMUM

B. DUST-FREE (COTTON FIBER METHOD): 25 MINUTES, MAXIMUM

C. TACK-FREE (FINGER METHOD): 30 MINUTES, MAXIMUM

D. DRY FOR RECOATING: 1 HOUR, MAXIMUM

E. DRY HARD: 2 HOURS, MAXIMUM

F. DRY-THROUGH: 24 HOURS, MAXIMUM

G. FULL HARDNESS: 32 HOURS, MAXIMUM

2. FORCE-DRY AT 150 ± 3.6°F (METHOD 4061)

A. DRY-THROUGH: 1 HOUR, MAXIMUM

B. FULL HARDNESS: 2 HOURS MAXIMUM

3. FORCE-DRY AT 250 ± 3.6°F (METHOD 4061)

A. DRY-THROUGH: 30 MINUTES, MAXIMUM

B. FULL-HARDNESS: 1 HOUR, MAXIMUM

C. STORAGE STABILITY (METHOD 4142): THE SEPARATELY PACKAGED COMPONENTS SHALL BE USABLE WHEN STORED FOR A MINIMUM OF 12 MONTHS IN CLOSED CONTAINERS AT A MAXIMUM TEMPERATURE OF 100°F.

D. POT-LIFE STABILITY: THE MIXED COATING SHALL BE SUITABLE FOR USE FOR A MINIMUM OF EIGHT HOURS WHEN STORED IN A COVERED PARTLY FILLED CONTAINER AT ROOM CONDITIONS. THE MAXIMUM VISCOSITY SHALL BE 34 SECONDS WHEN MEASURED WITH A ZAHN CUP NO. 2 AT 77 ± 2° F.

E. SELF-LIFTING PROPERTIES: COATINGS SHALL NOT EXHIBIT LIFTING OR OTHER SURFACE IRREGULARITIES WHEN TESTED AS FOLLOWS:

SPRAY MIXED COATING TO A DRY FILM THICKNESS OF 1.5 TO 3.0 MILS ON TWO 0.020 INCH THICK 2014-T6 ALUMINUM SHEET PANELS. PANELS SHALL HAVE BEEN PREVIOUSLY CHEMICALLY FILM TREATED IN ACCORDANCE WITH MIL-C-5541, TYPE I OR II, GRADE A, B, OR C, CLASS 2. SPRAY A SECOND COAT AT ONE-HOUR AIR DRYING TIME TO ONE PANEL AND A 24-HOURS AIR-DRYING TIME TO THE SECOND PANEL.

F. ODOR (METHOD 4401): THE ODOR OF THE COMPONENTS DURING MIXING AND APPLICATION, AND THE ODOR OF THE CURED FILM SHALL NOT BE NOTICEABLY OFFENSIVE NOR DISAGREEABLE.

G. TOXICITY: THE COATING SHALL NOT CONTAIN CONSTITUENTS OF KNOWN OR SUSPECTED TOXICITY, EXCEPT THOSE DESCRIBED IN WRITING BY THE SUPPLIER.

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS				

KIC NO. 74471482001 THRU 2003

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± — DECIMALS ± — ANGLES ± —
DO NOT SCALE THIS DRAWING

MATERIAL

NEXT ASSY | USED ON

APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

DRAWN M. MENZORIO 8-20-66
CHECKED A. Crotti 20 AUG 65
APPROVED
APPROVED E. Mroz 9/6/65
APPROVED MIT M G Mueller 9 Sept 65
NOT REQUIRED PER LETTER
APPROVED MSC PP7-65-612
DATE

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

COATING KIT, LIGHT-DIFFUSING
SOURCE CONTROL DWG

CODE IDENT NO. 80230 | SIZE C | DRAWING NO. 1012543

SCALE

SHEET 2 OF 4

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22338			9-8-65	
A		REVISED PER TDRR 25206			1/	
B		REVISED PER TDRR 28066			4/	
C		REVISED PER TDRR 28746	MDL		5/16/66	

H. SPRAYABILITY (METHOD 4331): THE COATING SHALL PRODUCE A SMOOTH UNIFORM FILM WHEN SPRAYED.

I. SPECULAR GLOSS:

1. 60-DEGREE GLOSS (METHOD 6101): ZERO, MAXIMUM

2. 85-DEGREE GLOSS (METHOD 6103): 2, MAXIMUM

J. TOTAL REFLECTANCE (METHOD 6121): TOTAL REFLECTANCE SHALL BE AS INDICATED IN TABLE I.

K. OXYGEN ATMOSPHERE RESISTANCE: NO LOSS OF ADHESION AND ONLY VERY SLIGHT YELLOWING OF THE WHITE COATING FILM SHALL RESULT ON STANDARD TEST PANELS (SEE NOTE) EXPOSED TO A 5 PSIA OXYGEN ATMOSPHERE AT 125°F FOR 14 DAYS. OXYGEN SHALL BE FLUSHED OUT AND REPLACED EACH 24 HOURS.

L. ADHESION: NO FAILURE OF ADHESION OF THE DRY COATING FILM APPLIED TO THE STANDARD TEST PANELS (SEE NOTE) NOR INTERCOAT ADHESION BETWEEN THE TWO COATS SHALL OCCUR WHEN TESTED AS FOLLOWS:

MAKE TWO SCRIBE MARKS ONE INCH APART THROUGH THE DRY COATING FILM ON TEST PANELS. WITH FIRM FINGER PRESSURE, APPLY A TWO-INCH LENGTH OF MASKING TAPE ACROSS THE SCRIBE MARKS AT A 90 DEGREE ANGLE. REMOVE THE TAPE WITH ONE ABRUPT PULL PERPENDICULAR TO THE PANEL SURFACE. REPEAT TEST ON PANELS ON WHICH A SECOND COAT IS SPRAYED AT ONE-HOUR AIR DRYING TIME TO ONE TEST PANEL AND A 24-HOURS AIR DRYING TIME TO A SECOND PANEL.

M. IMPACT RESISTANCE: THE DRY COATING FILM SHALL WITHSTAND 10 INCH-POUNDS REVERSE IMPACT WHEN STANDARD TEST PANELS (SEE NOTE) ARE TESTED FROM THE UNCOATED SIDE USING THE GARDNER IMPACT TESTER. NO FILM FAILURE SHALL BE VISIBLE UNDER FOUR-POWER MAGNIFICATION.

N. SCRUBBING RESISTANCE: THE DRY FILM SHALL NOT BURNISH NOR FAIL TO CONFORM TO THE SPECULAR GLOSS AND TOTAL REFLECTANCE REQUIREMENTS NOTED HEREON WHEN TESTED TO METHOD 6143.

O. FLEXIBILITY: NO CRACKS NOR LOSS OF ADHESION OF THE DRY COATING FILM SHALL RESULT WHEN STANDARD TEST PANELS (SEE NOTE) ARE SUCCESSFULLY TESTED TO A 3/8 INCH MANDREL PER ASTM 1737-62.

P. CHEMICAL RESISTANCE: NO VISIBLE FAILURE OF FILM, ADHESION OR INTEGRITY SHALL RESULT WHEN STANDARD TEST PANELS (SEE NOTE) ARE TESTED PER METHOD 6011 AFTER BEING IMMERSED FOR 24 HOURS AT 77 ± 5°F IN THE SOLUTIONS SHOWN BELOW:

1. DISTILLED WATER

2. ETHYLENE GLYCOL (1,2 ETHANDIOL) PER MIL-E-9500, 50% BY WEIGHT AND DISTILLED WATER, 50% BY WEIGHT.

3. ISOPROPYL ALCOHOL PER FEDERAL SPECIFICATION TT-I-735.

MASTER

KIC NO. 7447148200I THRU 2003

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING.
MATERIAL

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN M. MENZORIO 8-20-65
CHECKED A. Corletta 20AUG65
APPROVED
APPROVED E. Thorup 9/8/65

COATING KIT, LIGHT-DIFFUSING SOURCE CONTROL DWG

APPROVED MIT NOT REQUIRED PER LETTER
APPROVED MSC PA7-65-612 DATE

CODE IDENT NO. 80230 | SIZE C | DRAWING NO. 1012543

SCALE | SHEET 3 OF 4

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
-		INITIAL RELEASE CLASS A PER TDRR 22338			9-8-65	WK
(4) A		REVISED PER TDRR 25206			1/5/66	WK
(NOT) B		REVISED PER TDRR 28066		R.U.	4/26/66	WK
C		REVISED PER TDRR 28746	GDL		5-17-66	WK

FILM HARDNESS SHALL BE FULLY RECOVERED WITHIN FOUR HOURS AIR - DRYING, IF ANY SLIGHT SOFTENING OF THE FILM RESULTED FROM IMMERSION IN THE SOLUTIONS.

AFTER IMMERSION THE PANELS SHALL BE WASHED IN WATER AND AIR - DRIED AT AMBIENT CONDITIONS FOR FOUR HOURS.

Q. ENVIRONMENTAL REQUIREMENTS.

1. TEMPERATURE RESISTANCE: THE DRY FILM SHALL CONFORM TO THE SPECULAR GLOSS AND TOTAL REFLECTANCE REQUIREMENTS NOTED HEREON AFTER BEING SUBJECTED TO A TEMPERATURE OF 200° F FOR SIXTEEN HOURS. A SLIGHT DARKENING OF THE WHITE COATING FILM IS PERMISSIBLE.

2. VACUUM EMISSION: THERE SHALL BE A MAXIMUM OF 1% WEIGHT LOSS WHEN DRY FILM COATING IS SUBJECTED TO A VACUUM OF 4.5×10^{-8} MM OF Hg FOR SEVEN DAYS.

3. THE DRY FILM SHALL CONFORM TO THE SPECULAR GLOSS AND TOTAL REFLECTANCE REQUIREMENTS NOTED HEREON AFTER BEING SUBJECTED TO A VACUUM ENVIRONMENT OF 10^{-6} MM OF Hg OR LESS FOR EIGHT DAYS WHILE BEING SUBJECTED TO ONE (1) SOLAR CONSTANT OF RADIATION INTERMITTENTLY. THE TOTAL DURATION DURING THE EIGHT DAY PERIOD OF SUCH RADIATION EXPOSURE SHALL BE A MINIMUM OF TWELVE HOURS.

NO INDIVIDUAL EXPOSURE SHALL BE LESS THAN ONE (1) HOUR DURATION AND THE MINIMUM INTERVAL BETWEEN ANY TWO EXPOSURES SHALL BE 24 HOURS. A SLIGHT DARKENING OF THE WHITE COATING FILM IS PERMISSIBLE.

NOTES

1. STANDARD TEST PANELS: TESTING, UNLESS OTHERWISE SPECIFIED, SHALL BE PERFORMED ON 0.020 INCH THICK 2014 - T6 BARE ALUMINUM SHEET. THE SHEET SHALL HAVE BEEN PREVIOUSLY CHEMICALLY FILM TREATED IN ACCORDANCE WITH MIL-C-5541, TYPE I OR II, GRADE A, B, OR C CLASS 2. ONE SIDE OF TEST PANEL SHALL BE SPRAYED WITH MIXED COATING TO A DRY FILM THICKNESS OF 1.5 TO 3.0 MILS.

   FOR CHEMICAL RESISTANCE IMMERSION TESTS (SEE REQUIREMENT P) COATING SHALL BE APPLIED TO BOTH SIDES AND ALL EDGES.

   PANELS SHALL BE AIR-DRIED FOR SEVEN DAYS AT AMBIENT CONDITIONS OR FORCE DRIED AT 175 °F FOR TWO HOURS BEFORE TESTING.

2. REF: REFER TO ND 1002277 FOR APPLICATION PROCEDURE.

TABLE 1 CONTINUED

NASA DASH NO.	COLOR (REF)	WEIGHT (POUNDS PER GALLON) COMPONENT NO. 1	WEIGHT (POUNDS PER GALLON) MIXED COATING	SOLIDS (PERCENT BY WEIGHT) COMPONENT NO. 1	SOLIDS (PERCENT BY WEIGHT) MIXED COATING
001	BLACK	10.5 ± 0.5	10.1 ± 0.5	72 ± 2	64 ± 3
002	WHITE	11.75 ± 0.50	11.1 ± 0.5	72 ± 2	64 ± 3
003	GRAY	11.3 ± 0.5	10.8 ± 0.5	74 ± 2	66 ± 3

TABLE 1 CONTINUED

NASA DASH NO.	COLOR	COLOR NO.	TOTAL REFLECTANCE
001	BLACK	37038	3% MAXIMUM
002	WHITE	37875	85% MINIMUM
003	GRAY	36231	20 MINIMUM 25 MAXIMUM

NEXT ASSY	USED ON
APPLICATION	

KIC NO. 7447148200I THRU 2003

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± — ± — ± —
DO NOT SCALE THIS DRAWING

MATERIAL

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN M. MENZORIO 8-20-65
CHECKED J. Crosta 20 AUG 65
APPROVED
APPROVED E. Thorup 9/8/65
APPROVED MIT [signature] 9/8/65
APPROVED MSC NOT REQUIRED PER LETTER PA-PP7-65-612 DATE

COATING KIT
LIGHT- DIFFUSING
SOURCE CONTROL DWG

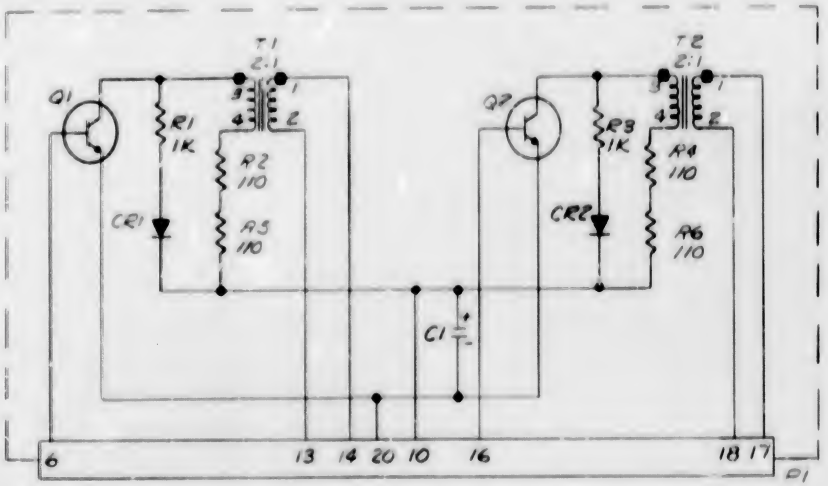
CODE IDENT NO.	SIZE	DRAWING NO.
80230	C	1012543

SCALE

SHEET 4 OF 4

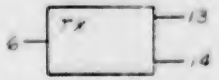
1012543

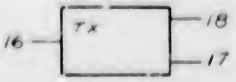
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR [illegible]	[illegible]	[illegible]



FOR INFORMATION ONLY
CLASS B RELEASE PER TDRR NO. [illegible] DATE

SYMBOL	PART NO.	DESCRIPTION	VALUE	TOL	RATING
C1	1006755-9	CAP.	1 μF	10%	35 V DC
CR1	1006751	DIODE			
CR2	1006751	DIODE			
P1	1014038	CONN			
Q1	1006752	TSTR			
Q2	1006752	TSTR			
R1	1006750-32	RES.	1K	1%	1/8 W
R2	1006760-9	RES.	110	2%	1/2 W
R3	1006750-32	RES.	1K	1%	1/8 W
R4	1006760-9	RES.	110	2%	1/2 W
R5	1006760-9	RES.	110	2%	1/2 W
R6	1006760-9	RES.	110	2%	1/2 W
T1	1006762	XMFR			
T2	1006762	XMFR			





NOTES

1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATIONS WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH

REFERENCES

1. MECHANICAL ASSY 1014053

(B) REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIAL			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS DECIMAL ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY USED ON
APPLICATION

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-438

DRAWN [illegible] DATE 9/10/68
CHECKED [illegible] 9/19/68
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MU APPROVAL [illegible]

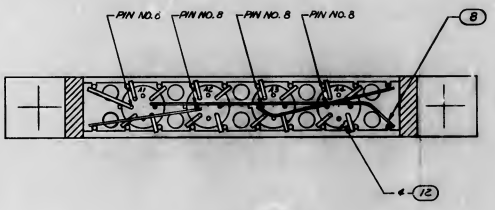
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SCHEMATIC
TRANSFORMER
DRIVER MODULE

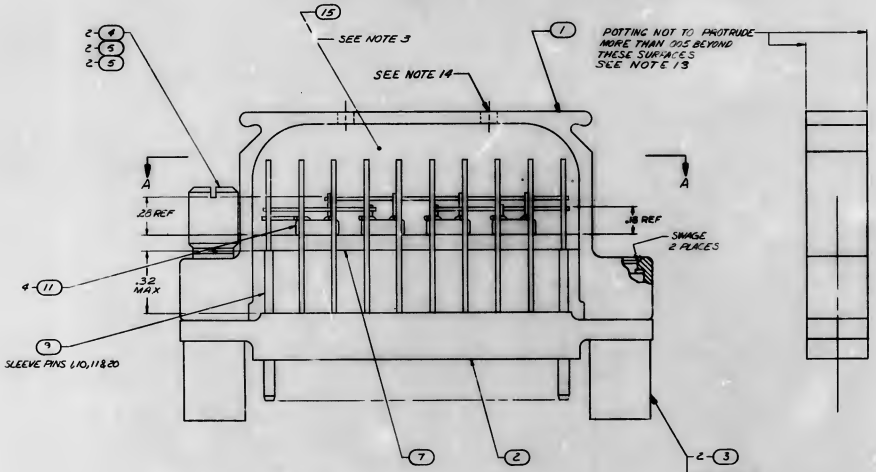
CODE IDENT NO.	SIZE	NEXT DRAWING NO.
	C	1014033

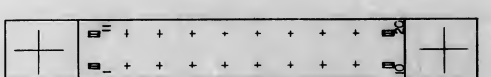
NEXT NONE | WT | SHEET 1 OF 1

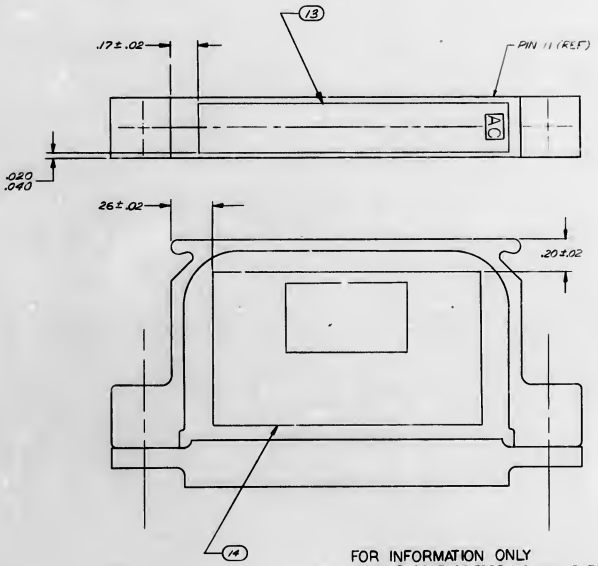
SYM	DESCRIPTION	DATE	APPROVED
—	ORIGINATED	9 FEB 63	
A	CHANGED PER TDR 00306 DR [illegible] CHK [illegible] APPD [illegible]	11 MAR 63	
B	CHANGED PER TDRR NO. 00532 DR E. WALLS CHK [illegible] APPD [illegible]	16 APR 63	
C	CHANGED PER TDRR NO. 00921 DR [illegible] CHK [illegible] APPD [illegible]	24 JUNE 63	
D	CLASS II CHANGE PER RD R 5297 B DR [illegible] CHK [illegible] APPD [illegible]	[illegible]	
E	CHANGED PER TDRR 10961 DR. W. Barnes CHK. [illegible] APPD. [illegible]	[illegible]	



SECTION A-A







FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 00194 DATE 12-14-63

NOTES
1. ~~WELD PER ND 1006005~~
2. ALL LEADS TO BE CLIPPED .010-.030 BEYOND WELDS
3. FILL WITH FIND NO.15 PER ND 1002183, COLOR BLACK
4. NUMBERS PRECEDING FIND NUMBER DENOTE QUANTITY
5. SEE 1014067 FOR POSITIONING OF PROGRAM TABS
6. ~~WASH IN HOT WATER DETERGENT SOLUTION~~
7. STAKE FIND NO.12 TO FIND NO.7 PER ND 1002004
8. ~~MARK IDENTIFICATION IN ACCORDANCE WITH MIL-STD-130~~
~~IN LOCATION SHOWN~~
9. BLACK DOT INDICATES THIRD LEVEL WIRING
10. CROSS HATCHING INDICATES SECOND LEVEL WIRING
11. ALL WIRING PER WIRING STANDARD NO. 1002003
12. UNUSED CONNECTOR LEADS MAYBE CUT FLUSH TO +.030 FROM UPPER SURFACE OF FIND NO.2 AND EXCESSIVE LEAD HEIGHT A MIN OF .030 ABOVE THE HIGHEST WELD OF EACH LEAD
13. NO BARE WIRE OR COMPONENTS TO SHOW THRU POTTING
14. POTTING TO BE FLUSH OR BELOW TOP OF VENT HOLES OF FIND NO.1

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
—	1014036	LOGIC DIAGRAM	REF
AR	1006904	EPOXY RESIN	15
1	1014200-2	DECAL IDENTIFICATION	14
1	1014138-2	DECAL IDENTIFICATION	13
4	1006771	MICRO-NOR GATE (TO-47)	12
4	1014069	TRANSI-PAD	11
~~AR~~	~~1006776-23~~	~~INSULATION SLEEVING~~	10
AR	1006776-20	INSULATION SLEEVING	9
AR	1006757-1	WIRE, ELECTRICAL (20 GA X 20)	8
1	1014068	MODULE INJECTION MOLDING	7
2	MS35337-79	WASHER LOCK	6
3	1006997	WASHER PLAIN FLAT	5
6	1006998-1	SCREW CAPTIVE	4
2	1014032	RECEPTACLE INDEXING	3
1	1014033	CONNECTOR 20 PIN	2
1	1014000-1	FRAME, MODULE	1

LIST OF MATERIALS

1014110		
1014099		
1014090		
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.

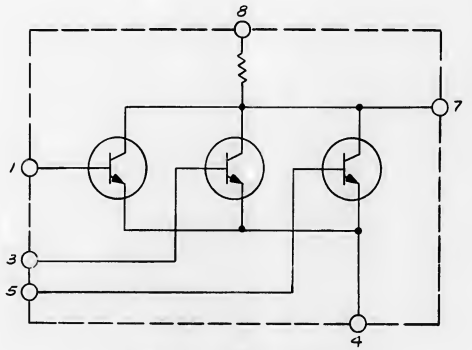
DRAWN [illegible] DATE 2-8-63
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

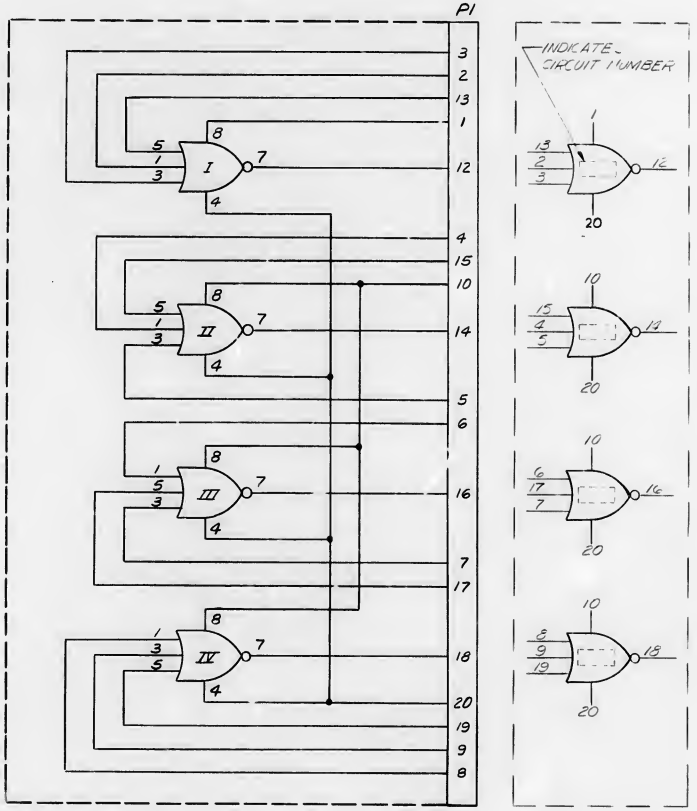
NOR MODULE
TO-47 SIZE

CODE IDENT NO —— SIZE J NASA DRAWING NO 1014034
SCALE 4/1 WT SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
M	ORIGINATED		
A	CHANGED PER TDR 00308 DR Widgeman CHK [illegible] APPD [illegible]	4 FEB 63	WK



SCHEMATIC, NOR LOGIC GATE



NOR MODULE

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING
I	1006780	ML NOR GATE			
II	1006780	ML NOR GATE			
III	1006780	ML NOR GATE			
IV	1006780	ML NOR GATE			

FOR INFORMATION ONLY
CLASS B RELEASE TDR NO. 00194 DATE 12 28 62

NOTES
1. ROMAN NUMERALS I THRU IV ARE REFERENCE DESIGNATIONS ONLY

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL
1014034		HEAT TREATMENT
NEXT ASSY	USED ON	FINAL FINISH
APPLICATION		

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO.
DRAWN W. Golasis DATE 19 DEC 2
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

LOGIC DIAGRAM
NOR MODULE
TO-47

CODE IDENT NO | SIZE D | NASA DRAWING NO 1014036
SCALE NONE | WT | SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1014036

ASSEMBLY INFORMATION CHART

FROM REMARKS	FROM CONNECT.	FROM RUN NO.	DESCRIPTION COLOR	DESCRIPTION AWG	DESCRIPTION FIND NO.	TO RUN NO.	TO REMARKS
	A1	1	WHITE	24	13	239	
	A2	2				230	
	A3	3				236	
	A4	4				232	
	A5	5				238	
	A6	6				234	
	A7	7				222	
	A8	8				226	
	A9	9				233	
	A10	10				216	
	A11	11				225	
	A12	12				229	
	A13	13				214	
	A14	14				221	
	A15	15				228	
	A16	16				237	
	A17	17				240	
	A18	18				211	
	A19	19				215	
	A20	20				220	
	A21	21				231	
	A22	22				235	
	A23	23				214	
	A24	24				224	
	A25	25				212	
	A26	26				227	
	A27	27				213	
	A28	28				217	
	A29	29				219	
	A30	30				223	
	A31	31				202	
	A32	32				198	
	A33	33				208	
	A34	34				204	
	A35	35				194	
	A36	36				210	
	A37	37				197	
	A38	38				207	
	A39	39				186	
	A40	40				190	
	A41	41				201	
	A42	42				209	
	A43	43				206	
	A44	44				205	
	A45	45				200	
	A46	46				193	
	A47	47				184	
	A48	48				182	
	A49	49				196	
	A50	50				203	
	A51	51				192	
	A52	52				188	
	A53	53				199	
	A54	54				195	
	A55	55				187	
	A56	56				189	
	A57	57				183	
	A58	58				191	
	A59	59				185	
	A60	60	WHITE	24	13	181	

ASSEMBLY INFORMATION CHART

FROM REMARKS	FROM CONNECT.	FROM RUN NO.	DESCRIPTION COLOR	DESCRIPTION AWG	DESCRIPTION FIND NO.	TO RUN NO.	TO REMARKS
	A61	61	WHITE	24	13	179	
	A62	62				170	
	A63	63				176	
	A64	64				172	
	A65	65				178	
	A66	66				174	
	A67	67				162	
	A68	68				166	
	A69	69				173	
	A70	70				158	
	A71	71				165	
	A72	72				169	
	A73	73				156	
	A74	74				161	
	A75	75				168	
	A76	76				177	
	A77	77				160	
	A78	78				151	
	A79	79				155	
	A80	80				160	
	A81	81				171	
	A82	82				175	
	A83	83				154	
	A84	84				164	
	A85	85				152	
	A86	86				167	
	A87	87				153	
	A88	88				157	
	A89	89				159	
	A90	90				163	
	A91	91				142	
	A92	92				138	
	A93	93				148	
	A94	94				144	
	A95	95				134	
	A96	96				150	
	A97	97				137	
	A98	98				147	
	A99	99				126	
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	A101	101				141	
	A102	102				149	
	A103	103				146	
	A104	104				145	
	A105	105				140	
	A106	106				133	
	A107	107				124	
	A108	108				122	
	A109	109				136	
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	A111	111				132	
	A112	112				128	
	A113	113				139	
	A114	114				135	
	A115	115				127	
	A116	116				129	
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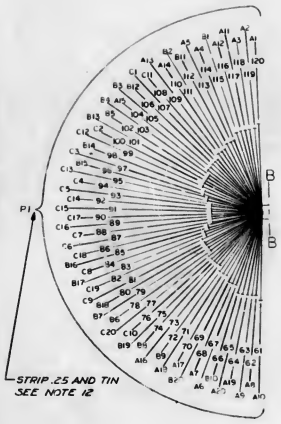
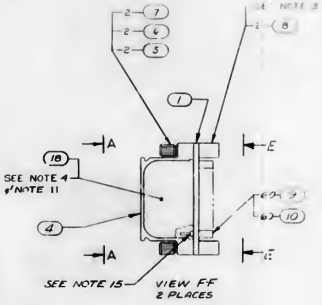
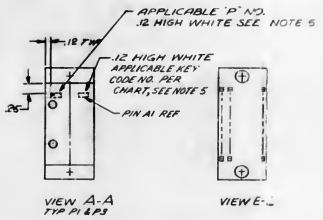
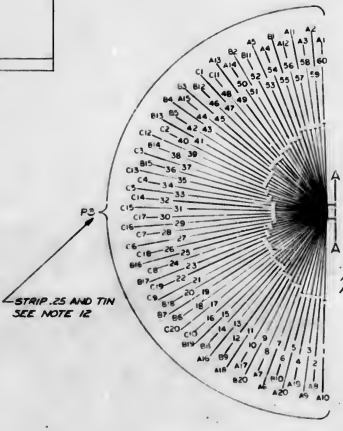
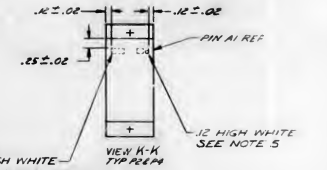
	A120	120	WHITE	24	13	121	







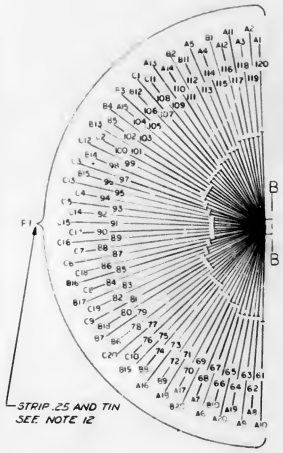


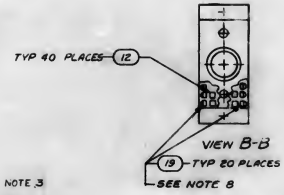


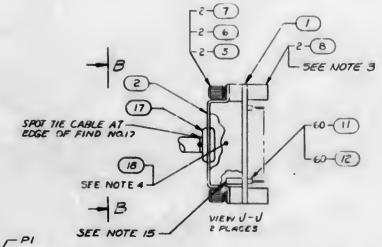
NOTES

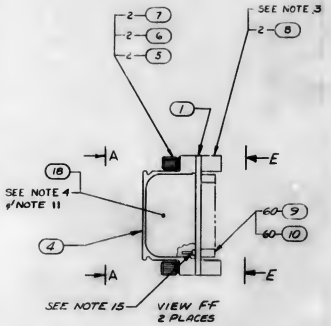
1. FOE FABRICATION SEE ND 1002032 EXCEPT USE FIND NO.23.
2. ROTATE 90° CW TO CORRECT POSITION BEFORE LACING.
3. LOCATE KEY IN POSITION PER KEY CODING CHART USING DWG NO. 1014047.
4. FILL WITH FIND NO.18 PER ND1002009 METHOD E, USING FIND NO. 22.
5. MARK NORMAL GOTHIC CHARACTERS AS SHOWN PER ND1002013 USING BLACK INK 1006256-001 & WHITE INK 1006271-1 AS REQ'D.
6. MIL-I-681, TYPE F, FORM U_2 GRADE 2 CLASS 1, CATEGORY I, AWG 5/8.
7. ~~MIL-I-23053, CLASS 1 COLOR BLACK SIZE NO. 416 FOR FIND NO. 18 SIZE NO. 915 FOR FIND NO. 19~~
8. NUMBER PRECEDING BALLOON DENOTES QUANITY.
9. INSTALL FIND NO.19 OUTSIDE ROWS ON P2 & P4
10. BOND USING FIND NO.21 APPROX. AS SHOWN.
11. POTTING TO BE .500 FROM SURFACES OF FIND NO 4.
12. SOLDER PER ND 1002071.
13. CEIMP PER ND 1002206.
14. SERIALIZE PER ND 1002023.
15. SEAL INSULATORS AND TERMINALS PER NO 1002004, TYPE III.
16. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN FOR COMPLETE DESIGNATION PREFIX WITH SUB-ASSEMBLY DESIGNATION.
17. AR DENOTES AS REQUIRED.
18. MARK CONDUCTOR IDENTIFICATION PER ND1002013.

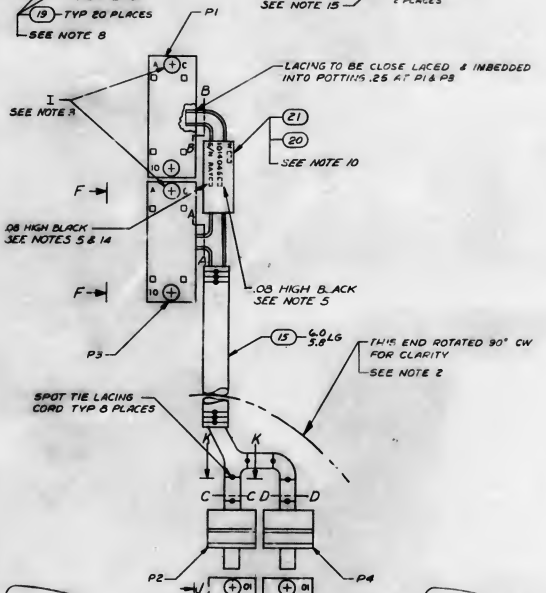
FORMATION CHART				
DESCRIPTION			TO	
R	AWG	FIND NO	RUN NO.	REMARKS
E	24	13	179	
			170	
			176	
			172	
			178	
			174	
			162	
			166	
			173	
			158	
			165	
			69	
			136	
			161	
			168	
			177	
			180	
			151	
			155	
			160	
			171	
			175	
			154	
			164	
			152	
			167	
			153	
			157	
			159	
			163	
			142	
			138	
			148	
			144	
			134	
			150	
			137	
			147	
			126	
			130	
			141	
			149	
			146	
			145	
			140	
			133	
			124	
			122	
			136	
			143	
			128	
			139	
			135	
			127	
			129	
			123	
			131	
			125	
E	24	13	121	

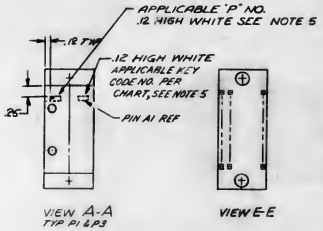


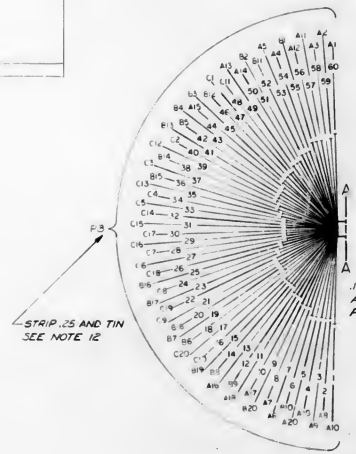


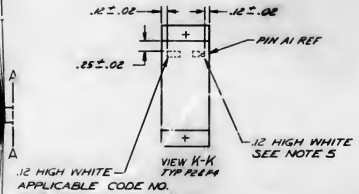


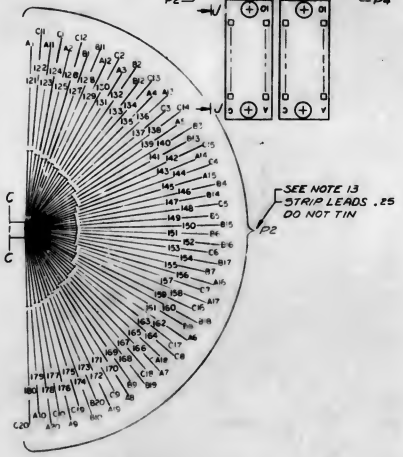


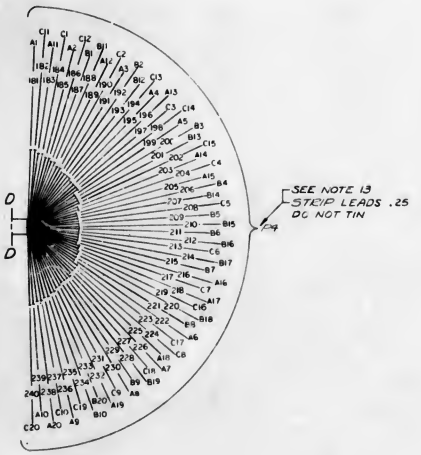


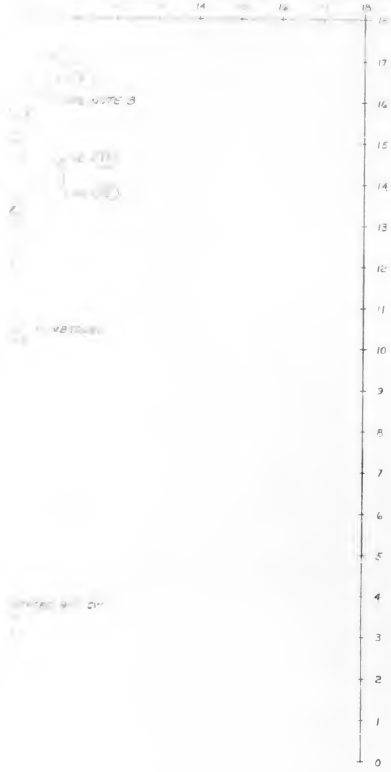


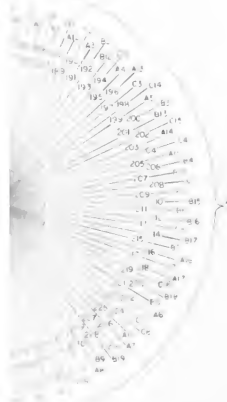




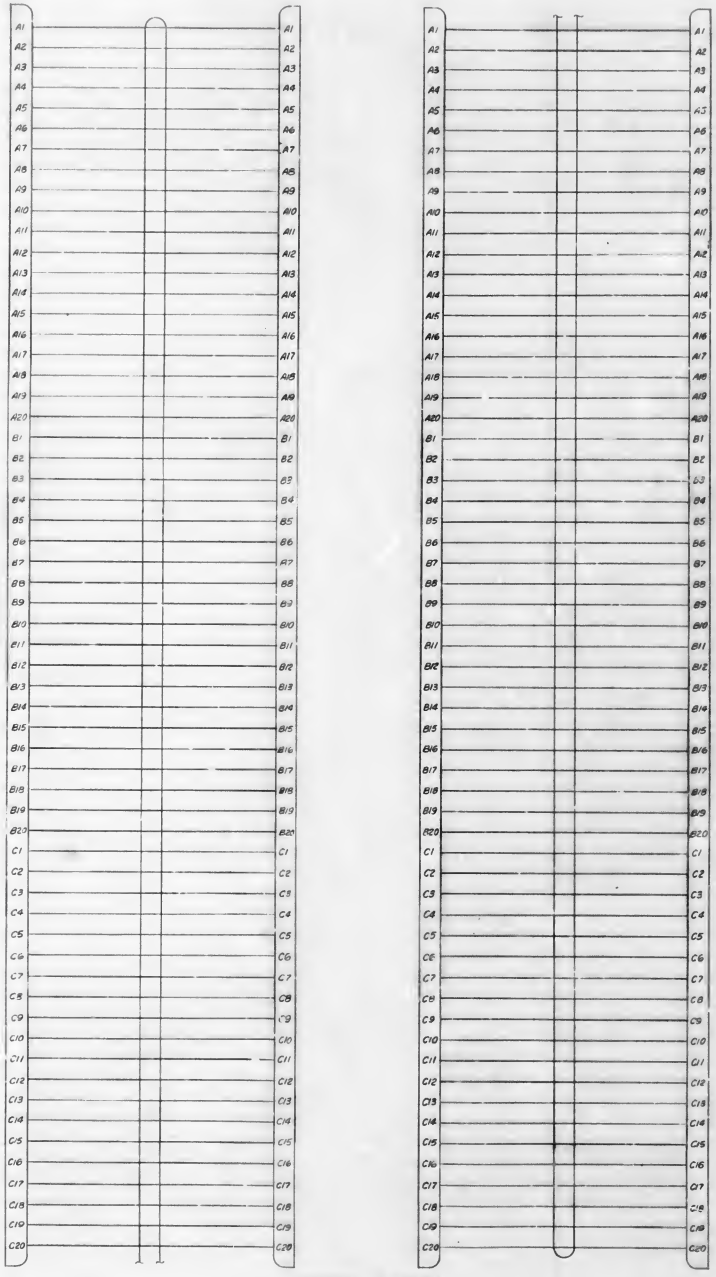








SEE NOTE 13
STRIP LEADS .25
DO NOT TIN



ELECTRICAL SCHEMATIC

1014046 L

EFFECTIVITY	REVISIONS			
	SYM	DESCRIPTION	DATE	APPROVED
	-	CLASS B RELEASED PER TDRR [illegible]	1/8 FEB 63	WK
	A	CHANGED PER TDRR 00409 PR Carlson CHK [illegible] APPD [illegible]		
	B	CHANGED PER TDRR 00698 DR [illegible] CHK [illegible] APPD [illegible]		
SER # 3 AND SUBS	C	CHANGED CLASS II PER RD-R5388 DRM Carlson CHK [illegible] APPD [illegible]	15 JUNE 63	
	L	CHANGE CLASS II PER RD-R-5271 DR [illegible] CHK [illegible] APPD [illegible]	6AUG 63	
	E	CHANGE PER TDRR 04780 DR E Crapo CHK [illegible] APPD [illegible]		
	F	CLASS II CHANGED PER RD R5397 DR A Bynum CHK [illegible] APPD [illegible]		
	G	CLASS II CHANGE PER RD R5676 DR [illegible] CHK [illegible] APPD [illegible]		
	H	CLASS II CHANGE PER RD R5769 DR [illegible] CHK [illegible] APPD [illegible]	24 FEB 64	
	J	CHANGED PER TDRR 08983 DR [illegible] CHK [illegible] APPD [illegible]		
	K	UPGRADE TO CLASS A WITH CHANGES PER TDRR 21170 DR [illegible] CHK [illegible] APPD [illegible]		
	L	CHANGE PER TDRR 21367 DR [illegible] CHK [illegible] APPD [illegible]		

PART NO.		KEY CODING POSITION				WIRE LEG
		PLUG	I	II	PLUG	I	II	
MM046-1		P1, P2	B	B	P3, P4	B	B	W1
	-2	P1, P2	B	A	P3, P4	B	A	W2
	-3	P1, P2	B	D	P3, P4	B	D	W3
	-4	P1, P3, P4	C	A	P2	A	N	W1
	-5	P1, P3, P4	C	B	P2	C	P	W2
	-6	P1, P3, P4	C	C	P2	G	C	W3
	-7	P1, P3, P4	C	D	P2	G	D	W4
	-8	P1, P3, P4	C	E	P2	G	F	W5
	-9	P1, P3, P4	C	F	P2	G	G	W1
	-10	P1, P3, P4	C	G	P2	G	H	W2
	-11	P1, P3, P4	C	H	P2	G	U	W3
	-12	P1, P3, P4	C	J	P2	G	K	W4
	-13	P1, P3, P4	C	K	P2	G	L	W5

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	ITEM NO
AR	1006453-004	TAPE, LACING	23
AR	1010718	PRIMER, ADHESIVE	22
AR	1006253	ADHESIVE	21
1	10481S-132	BAND, MARKER, CABLE	20
40	1014910	INSULATOR, CONTACT	19
AR	R006B3	COMPOUND SILICONE RUBBER	18
2	MS35489-13	GROMMET	17
AR	SEE NOTE 5	SLEEVING	16
* 08	SEE NOTE 6	SLEEVING	15
AR	SEE NOTE 7	SLEEVING	14
* REQUIRED	W, WIRE, TYPE 22 AWG	WIRE, ELECTRICAL	13
80	1006987	INSULATOR, CONTACT, ELECTRICAL, MALE	12
120	1006995	CONTACT, ELECTRICAL, MALE	11
120	1010380	INSULATOR, BUSHING, FEMALE	10
120	1010379-1	CONTACT, ELECTRICAL, FEMALE	9
3	10 .032	RECEPTACLE, INDEXING	8
8	1006997	WASHER, FLAT	7
8	NS35337-79	WASHER, LOCK	6
4	1006998-1	SCREW, CAPTIVE	5
2	1014000 2	FRAME, MODULE	4
4	1014023	BRACKET	3
2	1014024-1	BRACKET, ANGLE	2
4	1014021	PLATE, CONNECTOR	1

* DENOTES LENGTH IN FEET

LIST OF MATERIALS

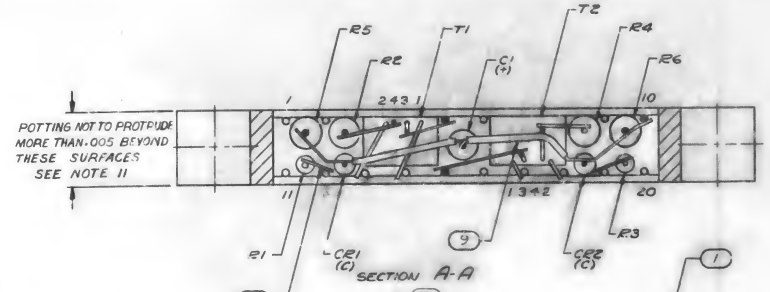
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES 3 ±.06 ±	RAYTHEON CO. LEXINGTON, MASS. CONT NO NAS 9-153	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
1017127 1019127 1014061	MATERIAL	CABLE ASSY	
NEXT ASSY	USED ON	HEAT TREATMENT	FINISH	CAGE CODE 49956	SIZE J	DRAWING NO 1014046
APPLICATION						

PREPARED DRAWING IN ACCORDANCE WITH STANDARDS PROCEDURES ES 30-2-1047

1014046 L

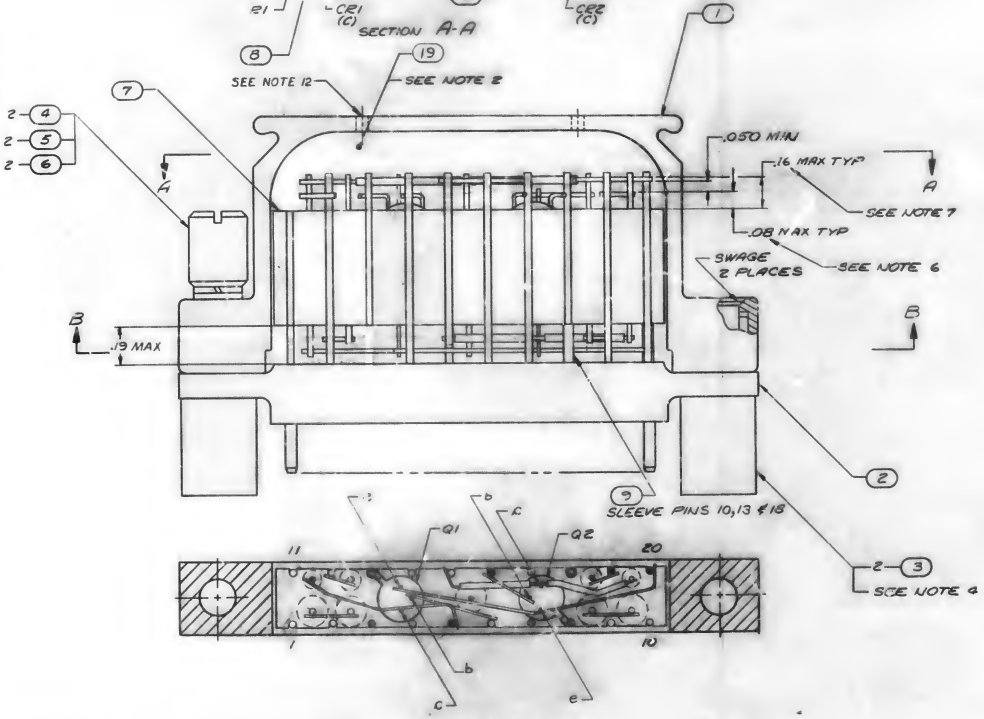
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR 00684	3/29/63	WK
C	CHANGED PER TDRR 00949 DR CHK Book APPD	8/14/63	WK
D	CLASS II CHANGE PER RD R 5296C DR CHK APPD	9-5-63	WK
E	CHANGED PER TDRR 08887 DR CHK APPD	9/JUNE/64	WK

FOR INFORMATION ONLY
CLASS B RELEASE PER TDRR NO. 00194 DATE 1/2

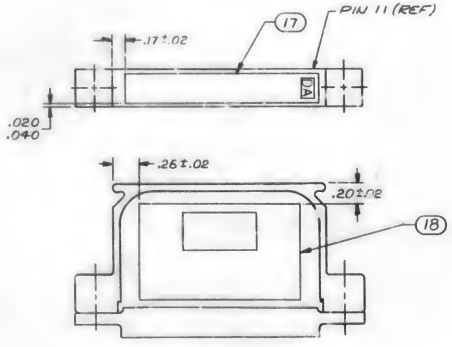


SECTION A-A

REF DESIGNATIONS	
SYMBOL	FIND NO.
C1	11
CR1, CR2	12
Q1, Q2	19
R1, R3	14
R2, R4, R5, R6	15
T1, T2	16



SECTION B-B



MARKING VIEW
SCALE 2/1

(B) REPLACES REV A WITH CHANGE

	1014033	SCHEMATIC	REF
AR	1006904	EPOXY RESIN	19
1	1014200-1	DECAL, IDENT	18
1	1014199-1	DECAL, IDENT	17
2	1006762	TRANSFORMER, PULSE	16
4	1006760-3	RESISTOR 1/2W 110 ±2%	15
2	1006750-32	RESISTOR, 1/4W 1K ±1%	14
2	1006752	TRANSISTOR	13
2	1006751	SEMICONDUCTOR DEVICE DIODE	12
1	1006755-63	CAPACITOR, 1 uF 35 V DC	11
~~AR~~	~~1006776-03~~	~~INSULATION SLEEVING~~	~~10~~
AR	006776-20	INSULATION, SLEEVING	9
AR	1006757-1	WIRE, ELECTRICAL	8
1	1014008	MODULE, INJECTION MOLDING	7
2	MS35337-79	WASHER, LOCK	6
2	1006997	WASHER, PLAIN FLAT	5
2	1006998-1	SCREW, CAPTIVE	4
2	1014032	RECEPTACLE, INDEXING	3
1	1014038	CONNECTOR, 20 PIN	2
1	1014000-1	FRAME, MODULE	1
QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NOTES
1. WIRE PER NO 1002003
2. FILL WITH FIND NO. 19 PER NO1002183 COLOR BLACK
3. NUMBERS PRECEDING BALLOONS DENOTE QUANTITY
4. SEE 1014047 FOR POSITIONING OF PROGRAM TABS
5. ~~MARK MANUFACTURER'S IDENTIFICATION IN ACCORDANCE WITH MIL STD 130 ARBOOK WHERE SHOWN~~
6. WHITE DOT INDICATES FIRST LEVEL WIRING
7. BLACK DOT INDICATES SECOND LEVEL WIRING
8. ~~MARK OR WASH WHITE CHARACTERS PER MIL 202B~~
9. STAKE FIND NO. 13 & 16 TO FIND NO. 7 PER NO 1002004
10. UNUSED CONNECTOR LEADS MAY BE CUT FLUSH TO +.030 WITH UPPER SURFACE OF FIND NO. 2 AND EXCESSIVE LEAD HEIGHT A MIN OF .030 ABOVE HIGHEST WELD ON EACH LEAD
11. NO BARE WIRE OR COMPONENTS TO SHOW THRU POTTING
12. POTTING TO BE FLUSH OR BELOW TO - OF VENT HOLES OF FIND NO. 1

1014050		
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

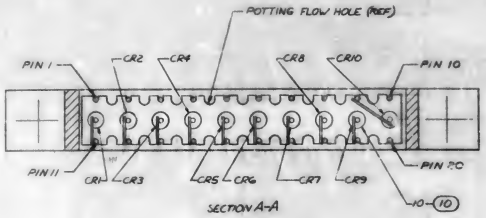
RAYTHEON CO
LEXINGTON, MASS
CONTRACT NO. NAS 9-898
DRAWN DATE 2-7-63
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

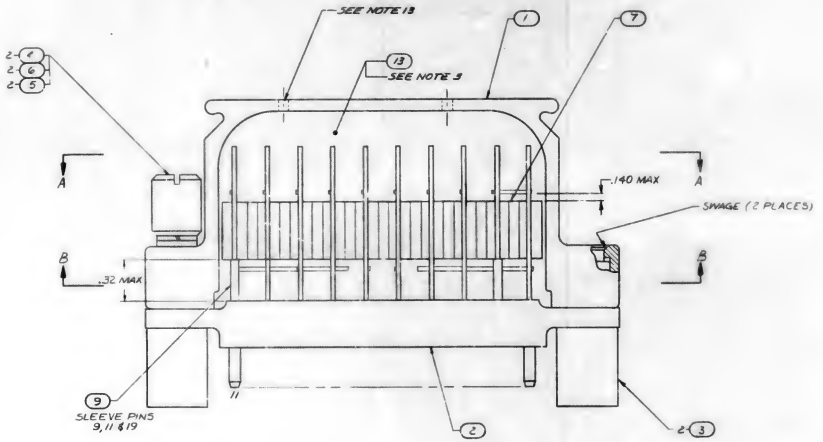
MANNED SPACECRAFT CENTER
HOUSTON TEXAS

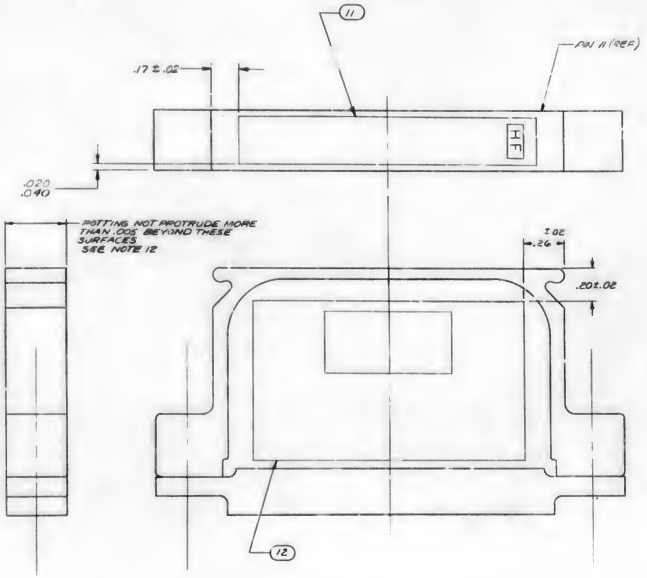
TRANSFORMER DRIVER MODULE

CODE IDENT NO	SIZE	NASA DRAWING NO
———	F	1014053
SCALE 4/1	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
(NEW)	CLASS B RELEASED PER TDRR 00279		
(A) A	CHANGED PER TDRR 00945 DR [illegible] CHK RB APPD [illegible]	5 Feb 63	WR
B	CLASS II CHANGE PER RD-A 5295C DR [illegible] CHK [illegible] APPD [illegible]	2-4-63	WJ
C	CHANGED PER TDRR 00888 DR [illegible] CHK [illegible] APPD [illegible]	3 June 63	WG



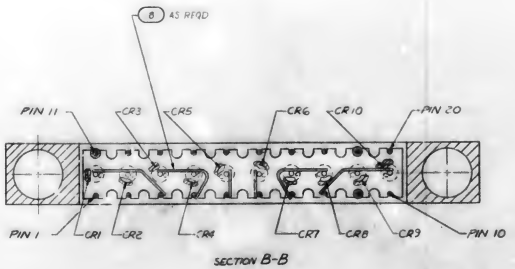




REFERENCE DESIGNATIONS	
SYMBOL	FIND NO.
CR1 - CR10	10

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 00279 DATE 23 Jan. 1963

NOTES
1. ~~WELD PER ND1006006~~
2. ~~ALL LEADS TO BE CLIPPED .010-.030 BEYOND WELDS~~
3. FILL WITH FIND NO. 13 PER ND 1002183 COLOR BLACK
4. NUMBERS PRECEDING FIND NUMBER DENOTES QUANTITY
5. SEE 1014047 FOR POSITIONING OF PROGRAM TABS
6. ~~MARK WITH WHITE CHARACTERS PER ND1006013~~
7. AR DENOTES AS REQUIRED
8. STAKE FIND NO 10 TO FIND NO 7 PER ND1002004
9. ~~MARK MFR IDENTIFICATION IN ACCORDANCE WITH MIL-STD-130 IN POSITION SHOWN~~
10. WIRE PER ND1002003
11. UNUSED CONNECTOR LEADS MAY BE CUT FLUSH TO +.030 FROM UPPER SURFACE OF FIND NO 2. AND EXCESSIVE LEAD HEIGHT A MIN OF .030 ABOVE THE HIGHEST WELD ON EACH LEAD
12. NO BARE WIRES OR COMPONENTS TO SHOW THRU POTTING
13. POTTING TO BE FLUSH OR BELOW TOP OF VENT HOLES OF FIND NO. 1



QTY. REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
—	1014062	SCHEMA 2	REF
AR	1006904	EPOXY RESIN	13
1	1014200-5	DECAL IDENT	12
1	1014199-5	DECAL IDENT	11
10	1006757	SEMICONDUCTOR DIODE	10
AR	1006736-20	INSULATION, SLEEVING	9
AR	1006757-1	WIRE, ELECTRICAL (.010 X .020)	8
1	1014017	INJECTION MOLDING	7
2	MS35333-79	WASHER, LOCK	6
2	NAS 997	WASHER, PLAIN FLAT	5
2	1006938-1	SCREW, CAPTIVE	4
2	1014032	RECEPTACLE, INDENTING	3
1	1014038	CONNECTOR, 20 PIN	2
1	1014000-1	FRAME, MODULE	1

LIST OF MATERIALS

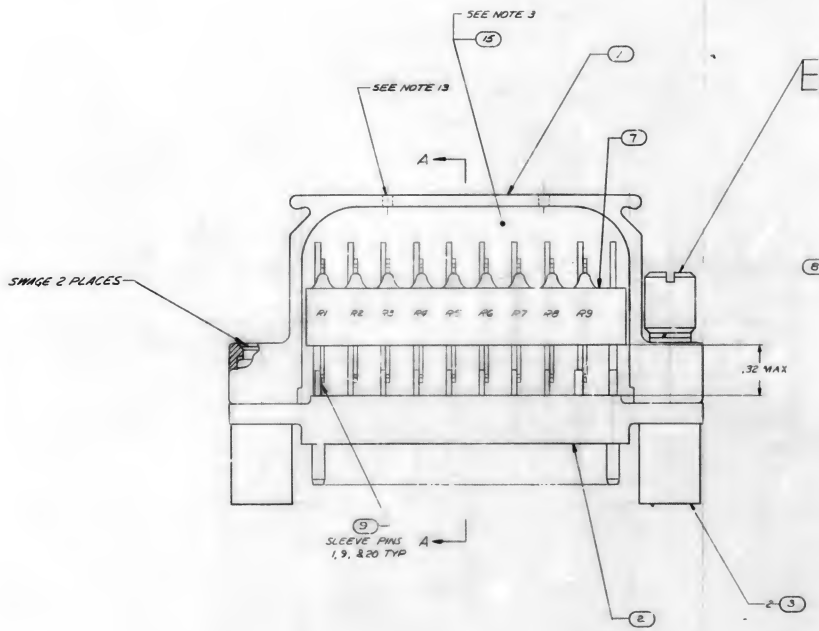
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±	RAYTHEON CO LEXINGTON, MASS. CONTRACT NAS 9-150	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
DO NOT SCALE THIS DRAWING MATERIAL	DRAWN [illegible] DATE 5 Oct 62 CHECKED [illegible] APPROVED [illegible] APPROVED [illegible] APPROVED [illegible]	DIODE MODULE	
1014110 1014099	HEAT TREATMENT FINAL FINISH	NASA APPROVAL [illegible] MIT APPROVAL [illegible] MIT APPROVAL [illegible]	SCALE 1/1 WT SIZE J IDENT NO. — NASA DRAWING NO. 1014064 SHEET 1 OF 1
NEXT ASSY	USED ON		
APPLICATION			

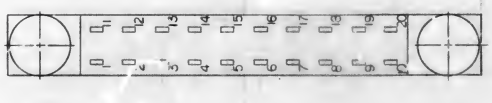
1014065 D

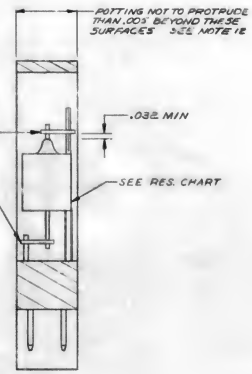
SYM	DESCRIPTION	DATE	APPROVED
D	CLASS B RELEASED PER TDRR [illegible]		
A	CHANGED PER TDRR 00688 DR [illegible] CHK [illegible] APPD 11/64		WK
B	CHANGED CLASS II PER ND-RS131 DR PS Dang CHK CJ APPD 11/64	5 JUN 65	GS
C	CLASS II CHANGE PER ND 52799C DR MD L CHK CJ APP'D Dec	9-7-65	
D	CHANGE PER TDRR 00861 DR AS CHK [illegible] APPD 11-64	10-66	

DECAL CHART	
ASSY NO.	FIND NO.
1014065-1	11 & 13
1014065-2	12 & 16
1014065-3	18 & 19

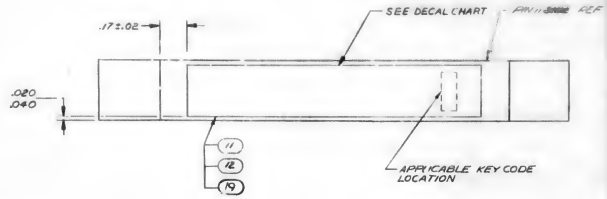
RESISTOR CHART		
REFERENCE DESIGNATION		
ASSY NO.	SYMBOL	FIND NO.
1014065-1	R1 - R9	10
1014065-2	R1 - R9	14
1014065-3	R1 - R9	17

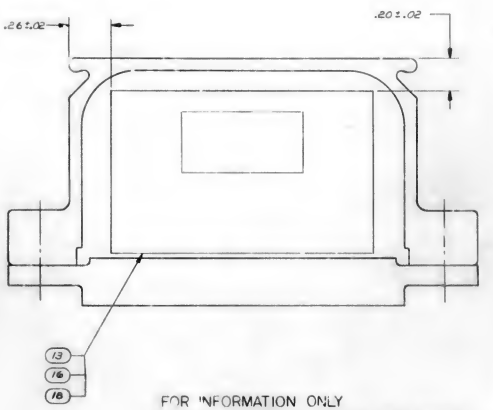






SECTION A-A





FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO.00279 DATE 23JAN63

REV STATUS OF ASSY	
ASSY NO.	REV
1014065-1	C
1014065-2	C
1014065-3	D

NOTES: -1, -2 & -3

~~1. PARTS ARE ASSEMBLED~~

~~2. ALL LEADS TO BE SOLDED IN ONE OPERATION~~

3. ENCAPSULATE WITH FIND NO. 15 PER ND 1002183 COLOR BLACK

4. NUMBER PRECEDING FIND NUMBER DENOTES QUANTITY

5. SEE ND 1247 FOR POSITIONING OF PROGRAM TABS

~~6. MARK WITH WHITE CHARACTERS PER MIL-STD-130~~

~~7. RESISTORS ARE TO BE COATED WITH CERAMIC VARNISH~~ ~~MIL-V-13~~ ~~TYPE II LAYER THICKNESS~~

8. STAKE FIND NO. 10 & FIND NO. 14 TO FIND NO. 7 PER ND1002004

~~9. MARK M.F.G. IDENTIFICATION IN ACCORDANCE WITH MIL-STD-130~~ ~~IN POSITION SHOWN~~

10. WIRE PER ND 1002003

11 UNUSED CONNECTOR LEADS MAY BE CUT TO .030 FROM UPPER SURFACE OF FIND NO. 2 AND EXCESSIVE LEAD (HEIGHT A MIN. .030 ABOVE THE HIGHEST WELD ON EACH LEAD.

12. NO BARE WIRES OR COMPONENTS TO SHOW THRU POTTING

13. POTTING TO BE FLUSH TO .04 BELOW TOP OF VENT HOLES OF FIND NO. 1

QTY NEED	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	-3 -2 -1		LIST OF MATERIALS	
		1020130	SCHEMATIC	REF
1	1	1014139-18	DECAL, IDENT	13
1	1	1014200-12	DECAL, IDENT	18
9	9	1006760-25	RESISTOR, 510Ω, ±2%, 1/2W	17
1	1	1014200-10	DECAL, IDENT	16
AR	AR	1006908	LACKY RESIN	1
9	9	1006760-16	RESISTOR, 62Ω, ±2%, 1/2W	14
1	1	1014200-6	DECAL, IDENT	13
1	1	1014139-10	DECAL, IDENT	12
X	X	1014203	SCHEMATIC	REF
1	X	1014066	SCHEMATIC	REF
1	1	1014182-6	DECAL, IDENT	11
9	9	1006760-46	RESISTOR 39K, ±2%, 1/2W	9
AR	AR	1006776-20	INITIATOR, SLEEVING	8
AR	AR	1006757-1	WIRE, ELECTRICAL #30 X 20	6
1	1	1014077	INJECTION MOULDING	7
2	2	MS35337-79	WASHER LOCK	5
2	2	1006997	WASHER PLAIN FLAT	3
2	2	1006390-1	SCREW, CAPTIVE	4
2	2	1014032	RECEPTACLE, INDEXING	4
1	1	1014038	CONNECTOR, 20 PIN	2
1	1	1014000-1	FRAME, MODULE	1

1014110			
1014099			
NEXT ASSY	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES °
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH

RAYTHEON CO. LEXINGTON, MASS. CONTRACT NO. NAS9-153

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

Drawn E Hallock DATE 6DEC65
CHECKED D Dowell 11DEC65
APPROVED C F Gilbert
APPROVED J Cunningham
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

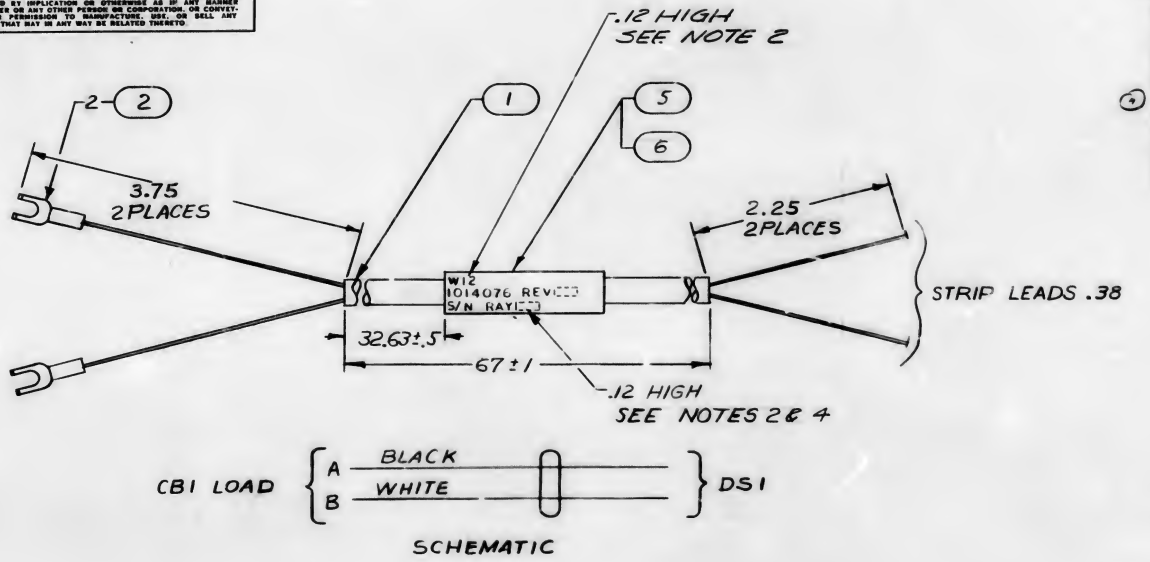
RESISTOR MODULE

CODE IDENT NO. 71279 SIZE J NASA DRAWING NO. 1014065

SCALE 4/1 WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	ORIGINATED		
A	REVISED CLASS II PER RD 5123 G.G. Caggiano CHK Tindall APPD Cas	6 MAY 63	
B	CHANGED PER TDRR 05041 DR R. Rose CHK W. J. Gill APPD	23 DEC 63	
C	UPGRADE TO CLASS A WITH CHANGES PER TDRR 16741 DR CHK APPD	11 MAR 65	KCS



NOTES:

1. FOR FABRICATION SEE ND1002032
2. MARK GOTHIC CHARACTERS AS SHOWN PER ND1002019 USING BLACK INK 1006256-001
3. ~~MIL-I-631c TYPE F, FORM U2 GRADE 2, CLASS 1, CATEGORY E, AWG 3/0~~
4. SERIALIZE PER ND1002023
5. BOND FIND NO.5 TO FIND NO. 1 USING FIND NO. 6

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
AR	MIL-A-5092 TYPE III	CEMENT, ADHESIVE	6
1	1014472-1A	BAND MARKER, CABLE	5
~~AR~~	~~SEE NOTE 3~~	~~SLEEVING~~	~~4~~
~~2~~	~~1006960-1~~	~~TERMINAL, SOLDERLESS~~	~~3~~
2	1006960-3	TERMINAL, SOLDERLESS	2
AR	1006966-3	CABLE, ELECTRICAL	1

LIST OF MATERIALS

1014076 1014101

1014217	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.03 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWN DATE 2-13-62
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

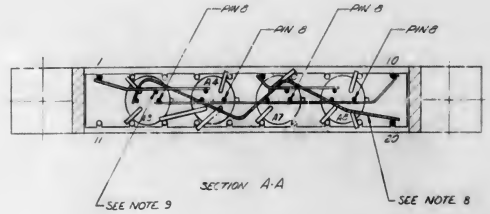
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

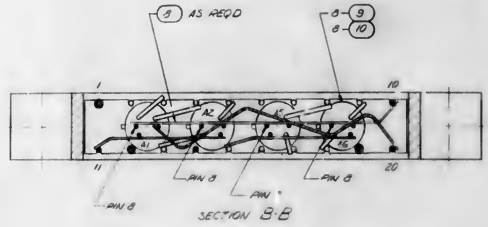
CABLE ASSEMBLY
W 12

CODE IDENT NO.	SIZE	NASA DRAWING NO.
	C	1014076
SCALE 1/1	WT	SHEET 1 OF 1

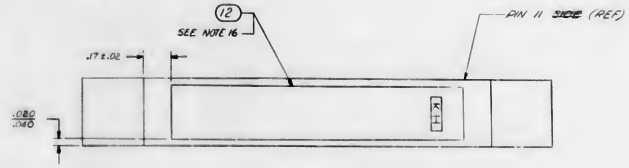
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

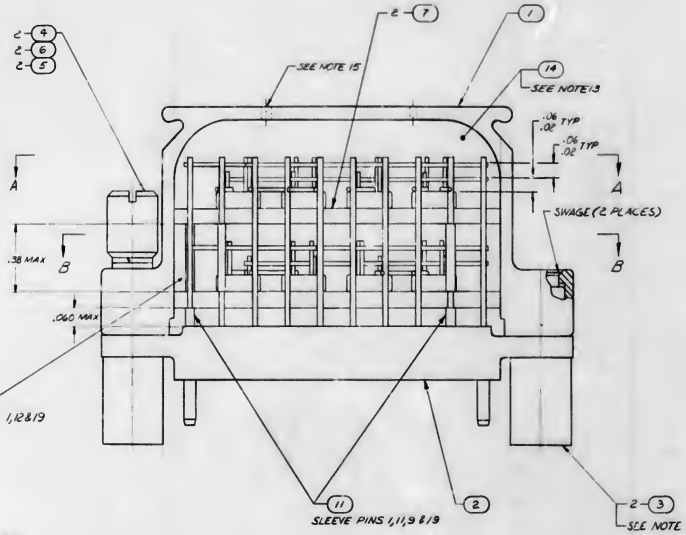
REVISIONS				
SYM	DESCRIPTION	DATE	APPROVED
-	CLASS B RELEASED PER TDRR NO. 00687		
A	CHANGED PER TDRR NO. 00687 DR BB CHK APPD		
B	CHANGED CLASS II PER RD 3738 DR QC CHK APPD	10 MAY 63	
C	CLASS II CHANGED PER RD-R 5294A DR CHK APPD	7 OCT 63	
D	CHANGED PER TDRR 08889 DR CHK APPD	2 JUNE 64	
E	CHANGED PER TDRR 12321 DR CHK APPD	14 SEPT 64	

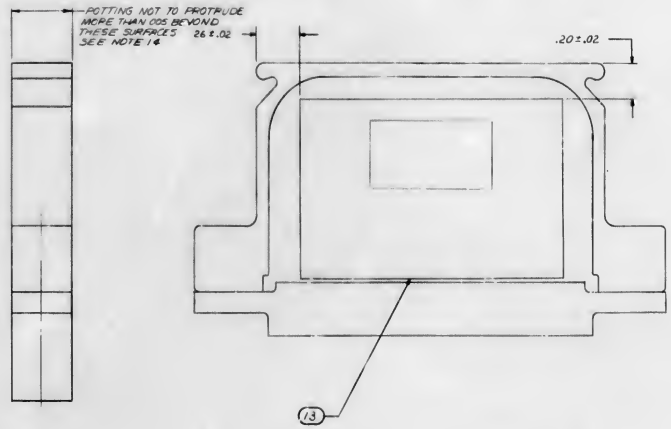




FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO 00687 DATE







REFERENCE DESIGNATION	
SYMBOL	FIND NO.
A1-A8	10

NOTES:
1. ~~NEED NO. NOMENCLATURE~~
2. ~~ALL LEADS TO BE CUT/CLINCHED TOO MANY DRIVING NEEDS~~
3. FILL WITH FIND NO. 14 PER ND 1002183 COLOR BLACK
4. NUMBER PRECEEDING FIND NUMBER DENOTES QUANTITY
5. SEE 1001117 FOR POSITIONING OF PROGRAM PINS
6. ~~MANUFACTURER'S NAME, ENGINEERS ASM NO. IGNORE~~
7. CLIP ALL UNUSED COMPONENT LEADS FLUSH WITH SURFACE OF FIND 9
8. CROSS HATCH INDICATES SECOND LEVEL WIRING
9. BLACK DOT INDICATES THIRD LEVEL WIRING
10. STAKE FIND NO. 10 TO FIND NO. 7 PER ND 1002004
11. ~~MARK MFG IDENTIFICATION IN ACCORDANCE WITH MIL-STD-130 IN POSITION SHOWN~~
12. WIRE PER ND 1002003
13. UNUSED CONNECTOR LEADS MAY BE CUT FLUSH TO .030 FROM UPPER SURFACE OF FIND NO. 2 AND EXCESSIVE LEAD HEIGHT A MIN. OF .030 ABOVE HIGHEST WELD ON EACH LEAD
14. NO BARE WIRES OR COMPONENTS TO SHOW THRU POTTING
15. POTTING TO BE FLUSH OR BELOW VENT HOLES OF FIND NO. 1
16. MARK WITH APPLICABLE REV. NO. & SERIAL NO. .06 HIGH IN APPROPRIATE BLOCK

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO.
-	1014072	LOGIC DIAGRAM	REF
A/R	1004904	EPOXY RESIN	4
1	1174100-3	DECAL, IDENT	13
1	1014199-3	DECAL, IDENT	12
A/R	1006776-20	INSULATION, SLEEVING	11
8	1006771	MICRO NOR GATE (TO-47)	10
8	1014069	TRANSPAD TO 47	9
A/R	1006757-1	WIRE, ELECTRICAL (.00+.020)	5
2	1012068	MODULE INTERCONNECTIONS	7
2	MS35337-79	WASHER, LOCK	6
2	1002897	WASHER, PLAIN, FLAT	4
2	1006998-1	SCREW, CAPTIVE	3
2	1014032	RECEPTACLE, INDEXING	2
1	1014038	CONNECTER, 20 PIN	8
1	1014000-1	FRAME, MODULE	1

LIST OF MATERIALS

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH	
1014110			
1014099			
1014090			
NEXT ASSY	USED ON		
APPLICATION			

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NAS 9-431
DRAWN [illegible] DATE 12/6/63
CHECKED [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]

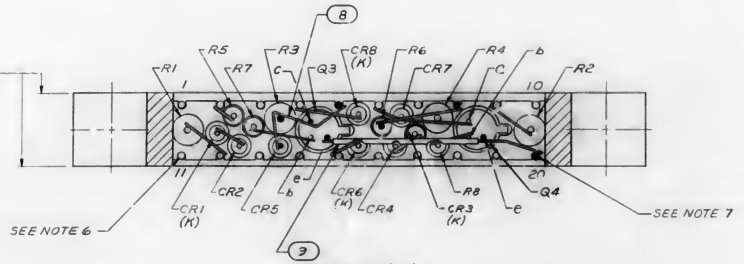
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

GATED FLIP-FLOP
MODULE (TO-47)

CODE IDENT NO | SIZE J | NASA DRAWING NO 1014079
SCALE 4/1 | WT | SHEET 1 OF 1

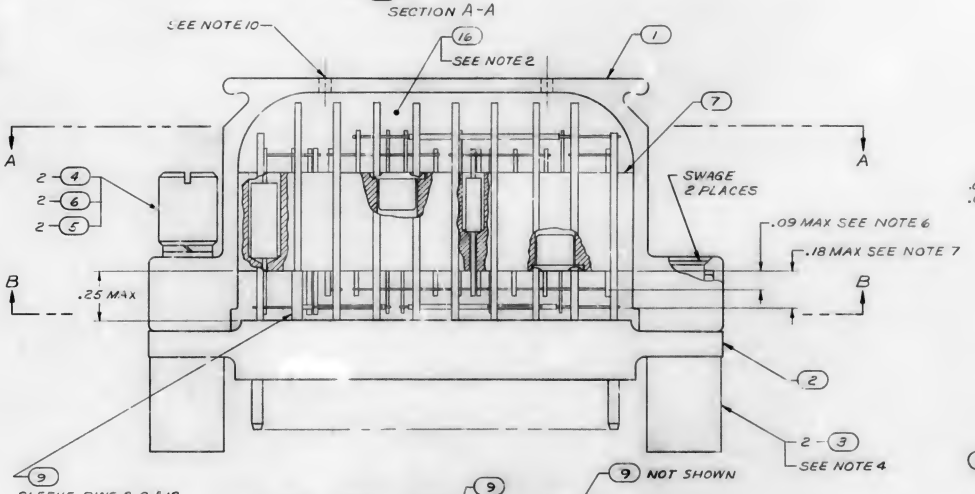
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
D	REPLACES REV C WITH CHANGE PER TDRR 09476 APPD		

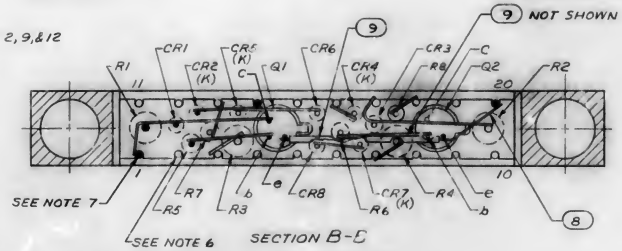
POTTING NOT TO PROTRUDE MORE THAN .005 BEYOND THESE SURFACES SEE NOTE 9



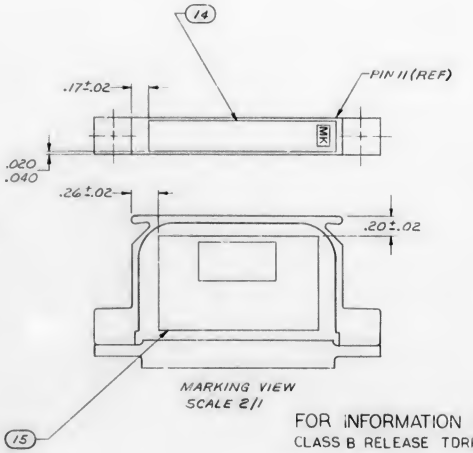
SECTION A-A

REF DESIGNATIONS	
SYMBOL	FIND NO.
R1, R2, R3, R4	11
R5, R6, R7, R8	10
Q1, Q2, Q3, Q4	12
CR1, CR2, CR3, CR4, CR5, CR6, CR7, CR8	13





SECTION B-B



MARKING VIEW
SCALE 2/1

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 00683 DATE 3-27-63

(D) REPLACES REV C WITH CHANGE

	1014123	SCHEMATIC	REF
AR	1006904	EPOXY RESIN	16
1	1014200-4	DECAL, IDENTIFICATION	15
1	1014199-4	DECAL, IDENTIFICATION	14
8	1006751	SEMICONDUCTOR DEVICE, DIODE	13
4	1006752	TRANSISTOR	12
4	1006760-29	RESISTOR ½W ±2% 750Ω	11
4	1006750-1	RESISTOR ¼W ±2% 51Ω	10
AR	1006776-20	INSULATION SLEEVING	9
AR	1006757-1	WIRE, ELECTRICAL	8
1	1014365	HOUSING, DRIVER MODULE	7
2	MS35337-79	WASHER, LOCK	6
2	1006997	WASHER, PLAIN FLAT	5
2	1006998-1	SCREW, CAPTIVE	4
2	1014032	RECEPTACLE, INDEXING	3
1	1014038	CONNECTOR, 20 PIN	2
1	1014000-1	FRAME, MODULE	1
QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

NOTES:
1. WIRE PER ND1002003
2. FILL WITH FIND NO.16 PER ND1002183 COLOR BLACK
3. NUMBERS PRECEDING BALLOONS INDICATE QUANTITIES
4. SEE 1014047 FOR POSITIONING OF PROGRAM TABS
5. STAKE FIND NO. 11, 12 & 13 TO FIND NO. 7 PER ND1002004
6. WHITE DOT INDICATES FIRST LEVEL WIRING
7. BLACK DOT INDICATES SECOND LEVEL WIRING
8. UNUSED CONNECTOR LEADS MAY BE CUT FLUSH TO +.030 FROM UPPER SURFACE OF FIND NO.2 & EXCESS LEAD HEIGHT A MIN OF.030 ABOVE THE HIGHEST WELL ON EACH LEAD
9. NO BARE WIRE OR COMPONENT TO SHOW THRU POTTING
10. POTTING TO BE FLUSH OR BELOW VENT HOLES OF FIND NO. 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1014090	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS DECIMALS ANGLES
± ±.03 ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
DRAWING DATE 10-2-63
CHECKED DATE 10-2-63
APPRO'AL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL

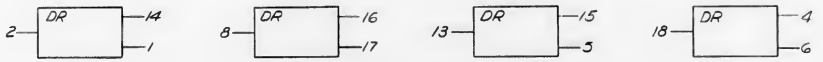
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

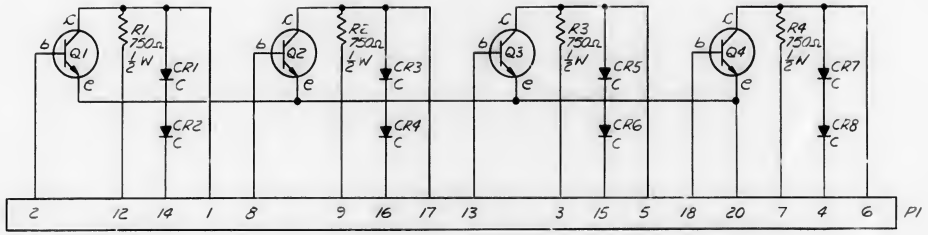
DRIVER MODULE

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	F	1014096
SCALE 4/1	WT	SHEET 1 OF 1

1014096

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	CLASS B RELEASED PER TDRR 00693	3-27-63	WC





FOR INFORMATION ONLY
CLASS B RELEASE PER TDRR NO. 00693 DATE 3/27/63

REFERENCE DRAWINGS
1. MECHANICAL ASSY 1014096

REF DES	PART NO.	DESCRIPTION	VALUE	TOL ±	RATING
CR1	1006751	DIODE			
CR2	1006751	DIODE			
CR3	1006751	DIODE			
CR4	1006751	DIODE			
CR5	1006751	DIODE			
CR6	1006751	DIODE			
CR7	1006751	DIODE			
CR8	1006751	DIODE			
Q1	1006752	TRANSISTOR			
Q2	1006752	TRANSISTOR			
Q3	1006752	TRANSISTOR			
Q4	1006752	TRANSISTOR			
R1	1006760-29	RESISTOR	750Ω	2%	½W
R2	1006760-29	RESISTOR	750Ω	2%	½W
R3	1006760-29	RESISTOR	750Ω	2%	½W
R4	1006760-29	RESISTOR	750Ω	2%	½W
P1	1014038	CONN			

NOTES
1. REFERENCE DESIGNATIONS ARE ABBREVIATED. PREFIX THE DESIGNATIONS WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
		DO NOT SCALE THIS DRAWING
		MATERIAL
		HEAT TREATMENT
NEXT ASSY	USED ON	FINAL FINISH
APPLICATION		

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

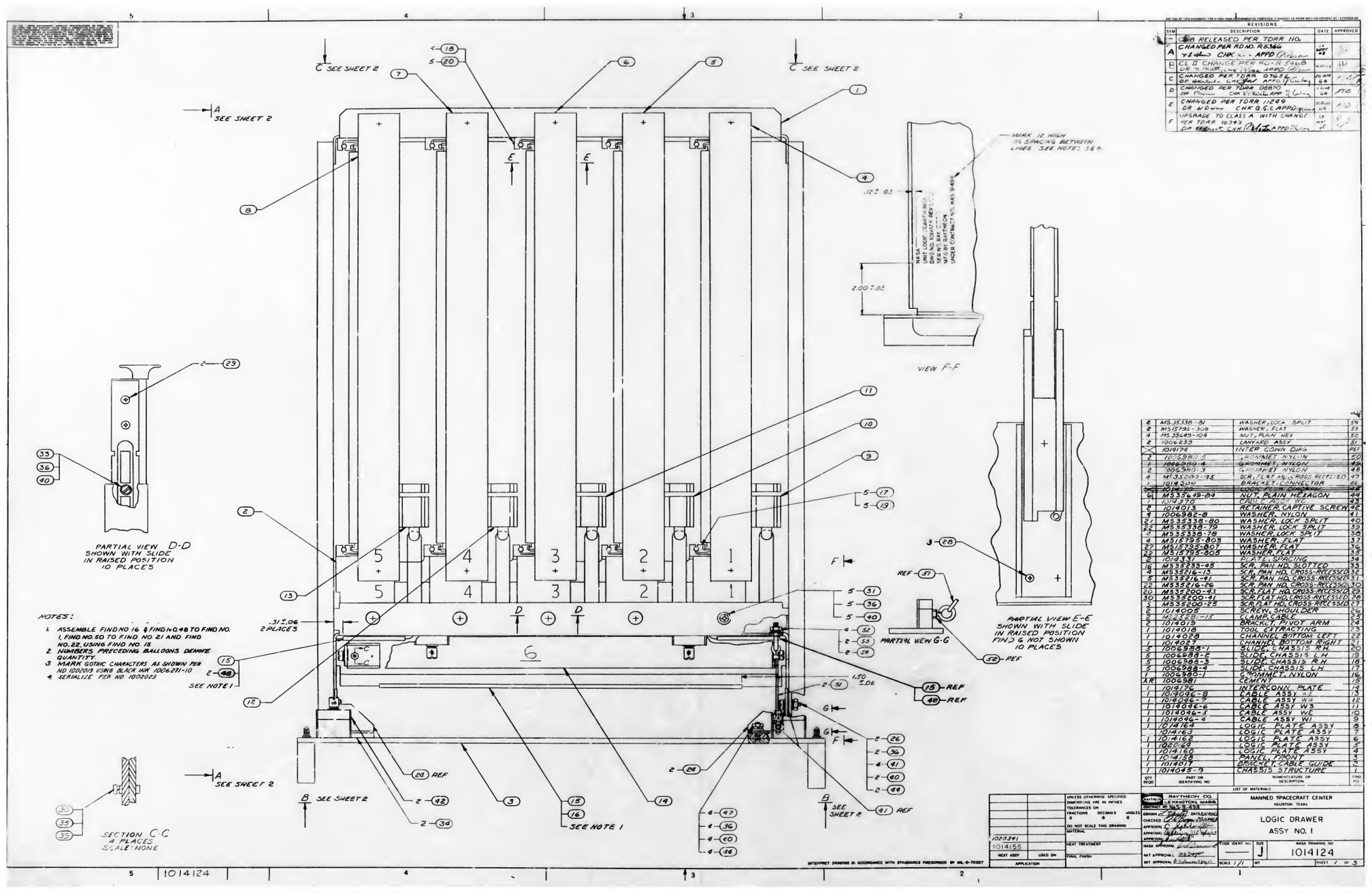
RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-498
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

DRAWN B. Jansen DATE 3/27/63
CHECKED R. J. Peters
APPROVAL J. W. Kamp
APPROVAL G. Bradford 3/27/63
APPROVAL C. Bentley (Actg)
NASA APPROVAL E. C. Wall 3/27/63
MIT APPROVAL Wilkinson 27 Mar 63

SCHEMATIC
DRIVER MODULE

CODE IDENT NO ——— SIZE D NASA DRAWING NO 1014123
SCALE NONE W/T SHEET / OF /

1014123



SYM	REVISIONS DESCRIPTION	DATE	APPROVED
-	RELEASED PER TDRR NO.		
A	CHANGED PER RO NO. R6566 73 chg CHK [illegible] APPD [illegible]	10 MAY 73	
B	CL II CHANGE PER RO-R 5468 DR [illegible] CHK [illegible] APPD [illegible]	MAY 14	
C	CHANGED PER TDRR 07965 DR [illegible] CHK [illegible] APPD [illegible]	JULY 20	
D	CHANGED PER TDRR 08870 DR [illegible] CHK [illegible] APPD [illegible]	31 JULY	
E	CHANGED PER TDRR 11249 DR [illegible] CHK [illegible] APPD [illegible]	10 AUG	
F	UPGRADE TO CLASS A WITH CHANGE PER TDRR 10393 DR [illegible] CHK [illegible] APPD [illegible]	10 MAY	

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
2	MS35338-31	WASHER, LOCK SPLIT	54
2	MS12791-308	WASHER, FLAT	53
4	MS35649-104	NUT, PLAIN HEX	52
2	1006233	LANYARD ASSY	51
X	1019179	INTER CONN DIAG	REF
2	1002983-5	GROMMET, NYLON	49
1	1006980-4	GROMMET, NYLON	48
2	1006980-3	GROMMET NYLON	47
4	MS35207-75	SCR, FLAT HD, CROSS RECESSED	46
1	1014300	BRACKET, CONNECTOR	45
1	1019178	CHART, PART ORDER	44
61	MS35619-84	NUT, PLAIN, HEXAGON	43
1	1019270	CABLE ASSY, W4	42
2	1014013	RETAINER, CAPTIVE SCREW	40
3	1006982-8	WASHER, NYLON	41
2	MS35338-80	WASHER, LOCK SPLIT	40
22	MS35338-79	WASHER, LOCK SPLIT	39
6	MS35338-78	WASHER, LOCK SPLIT	38
4	MS15795-803	WASHER, FLAT	37
82	MS15795-807	WASHER, FLAT	36
22	MS15795-805	WASHER, FLAT	35
2	1014330	PLATE, SPACING	34
16	MS35335-43	SCR, PAN HD, SLOTTED	33
4	MS35216-13	SCR, PAN HD, CROSS-RECESSED	32
5	MS35216-41	SCR, PAN HD, CROSS-RECESSED	31
22	MS35216-26	SCR, PAN HD, CROSS-RECESSED	30
20	MS35200-43	SCR, FLAT HD, CROSS-RECESSED	29
30	MS35200-41	SCR, FLAT HD, CROSS-RECESSED	28
5	MS35200-25	SCR, FLAT HD, CROSS-RECESSED	27
2	1014005	SCREW, SHOULDER	26
2	MS3367-12	CLAMP, CABLE	25
2	1014015	BRACKET, PIVOT ARM	24
1	1014018	TOOL, EXTRACTING	23
1	1014098	CHANNEL, BOTTOM LEFT	22
1	1014027	CHANNEL, BOTTOM RIGHT	21
5	1006988-1	SLIDE, CHASSIS R.H.	20
5	1006988-2	SLIDE, CHASSIS L.H.	19
5	1006986-3	SLIDE, CHASSIS R.H.	18
5	1006986-4	SLIDE, CHASSIS L.H.	17
1	1006980-1	GROMMET, NYLON	16
AR	1006981	CEMENT	15
1	1019176	INTERCONN. PLATE	14
1	1014046-8	CABLE ASSY W3	13
1	1014046-7	CABLE ASSY W2	12
1	1014046-6	CABLE ASSY W3	11
1	1014046-5	CABLE ASSY W2	10
1	1014046-4	CABLE ASSY W1	9
1	1014164	LOGIC PLATE ASSY	8
1	1014163	LOGIC PLATE ASSY	7
1	1014162	LOGIC PLATE ASSY	6
1	1020189	LOGIC PLATE ASSY	5
1	1014160	LOGIC PLATE ASSY	4
1	1014159	PANEL, FRONT	3
1	1014017	BRACKET, CABLE GUIDE	2
1	1014045-9	CHASSIS, STRUCTURE	1

LIST OF MATERIALS

1020341	HEAT TREATMENT	
1014156	FINAL FINISH	
NEXT ASSY	USED ON	
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±. DO NOT SCALE THIS DRAWING. MATERIAL.

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON CO. BEDFORD, MASS. CONTRACT NO. NAS9-4338

DRAWN [illegible] DATE 6/MAR/63
CHECKED [illegible]
APPROVAL C [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER HOUSTON, TEXAS

LOGIC DRAWER ASSY NO. 1

SCALE 1/1

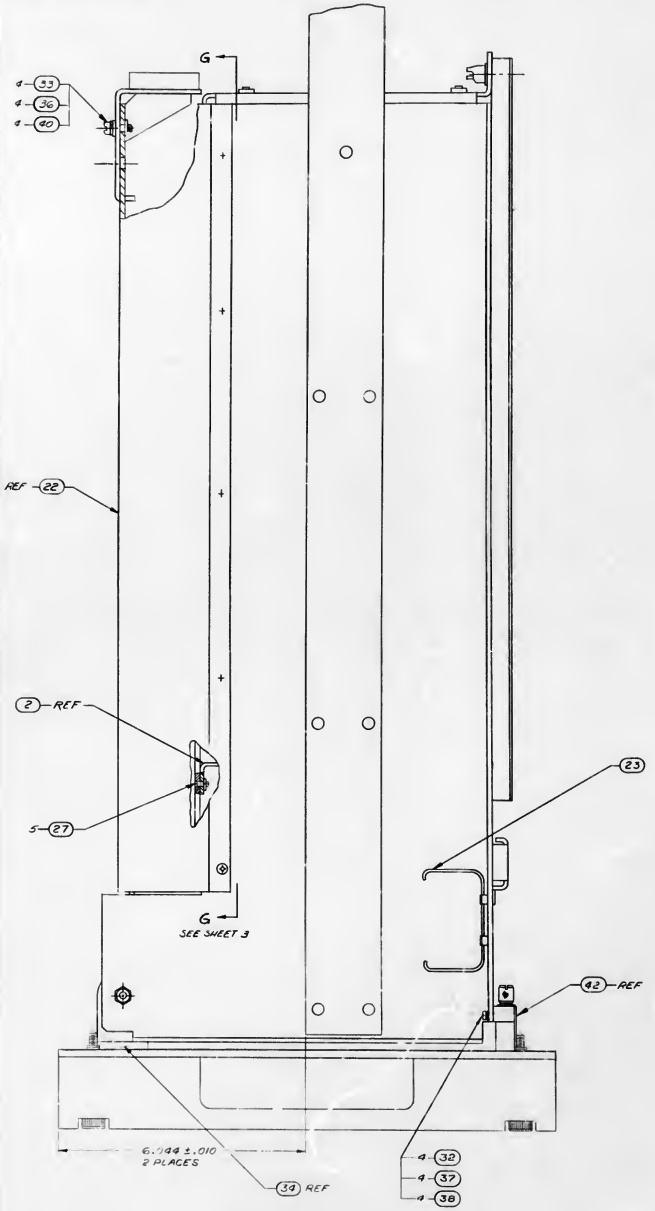
CODE IDENT NO. —— SIZE J NASA DRAWING NO. 1014124

WT

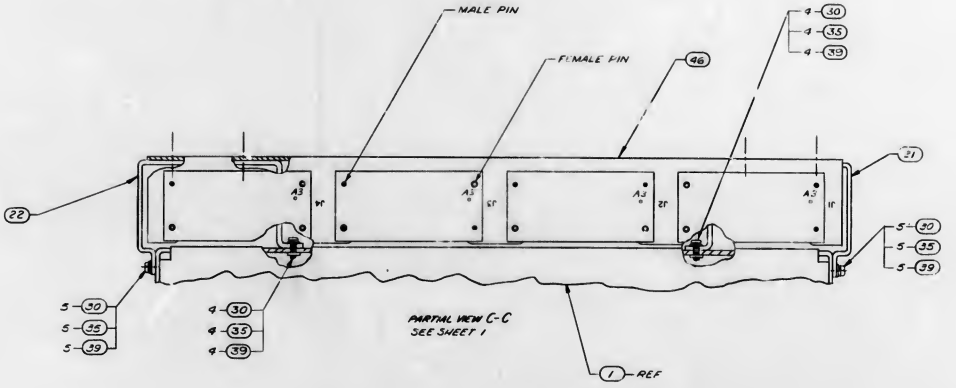
SHEET 1 OF 3

1014124

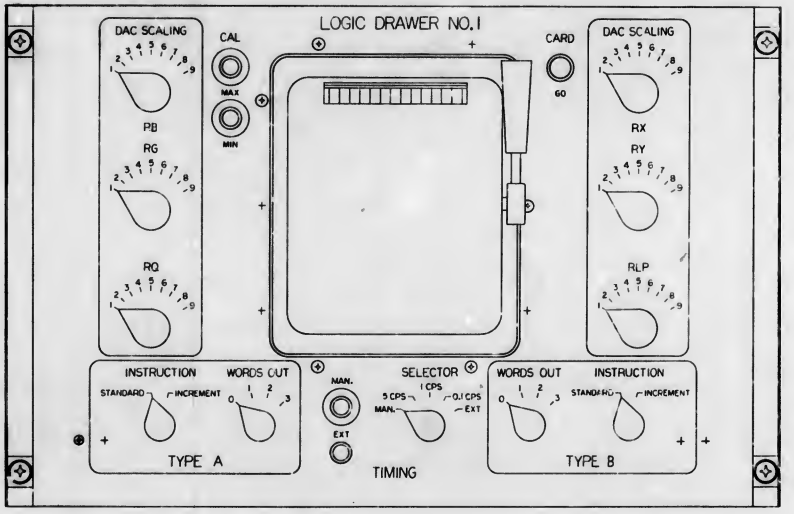
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
–	CL B RELEASED PER TDRR NO.		
A	CHANGED PER RD NO. R5366 CHK APPD	17 NOV 69	
C	CHANGED PER TDRR 07632 CHK APPD	20 JAN 70	
F	UPGRADE TO CLASS A PER TDRR 10393 CHK APPD		



VIEW A-A



PARTIAL VIEW C-C
SEE SHEET 1



VIEW B-B
SEE SHEET 1

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES °
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY
USED ON
APPLICATION

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NAS 9-498

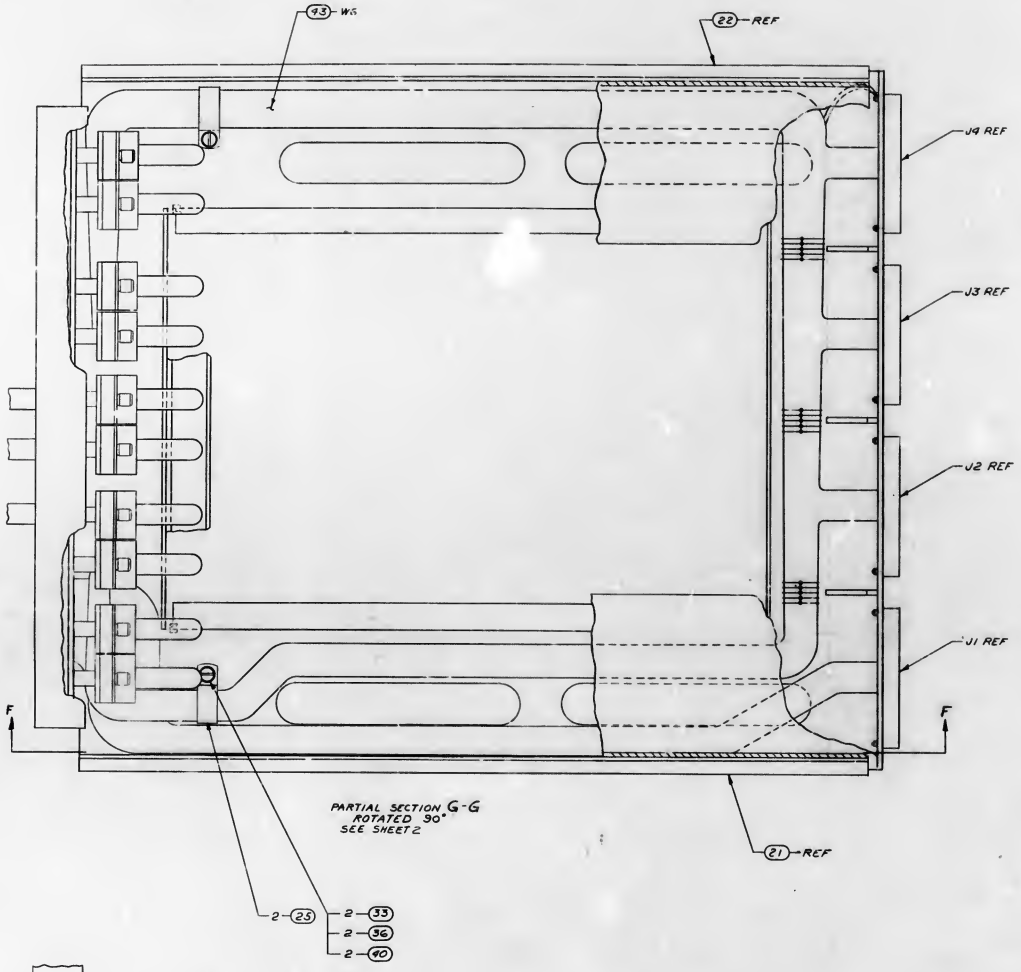
MANNED SPACECRAFT CENTER
HOUSTON TEXAS

DRAWN
CHECKED
APPROVAL
APPROVAL
APPROVED
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

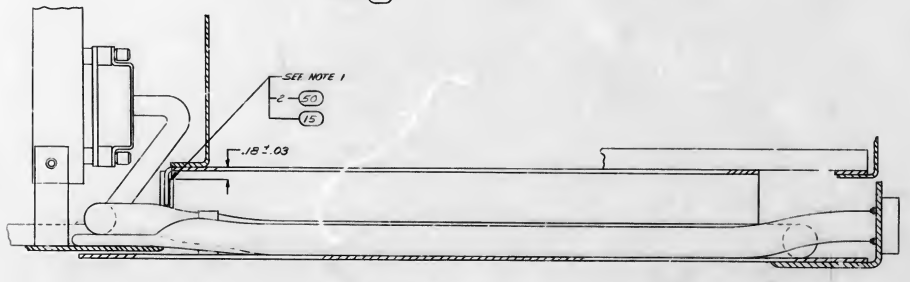
LOGIC DRAWER
ASSY NO. 1

CODE IDENT NO. —— SIZE J NASA DRAWING NO. 1014124
SCALE 1/1 WT SHEET 2 OF 3

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327



PARTIAL SECTION G-G
ROTATED 90°
SEE SHEET 2



PARTIAL SECTION F-F

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
-	CL B RELEASED TORR NO.		
A	CHANGED PER RD NO. A 5366 CHK'D - APPD	17 OCT 68	
C	CHANGED PER TORR NO. 07652 CHK'D - APPD	10 JAN 69	
F	UPGRADE TO CLASS 2 PER TORR 18943 DR CHK'D - APPD	20 FEB 69	

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMAL ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY | USED ON | APPLICATION

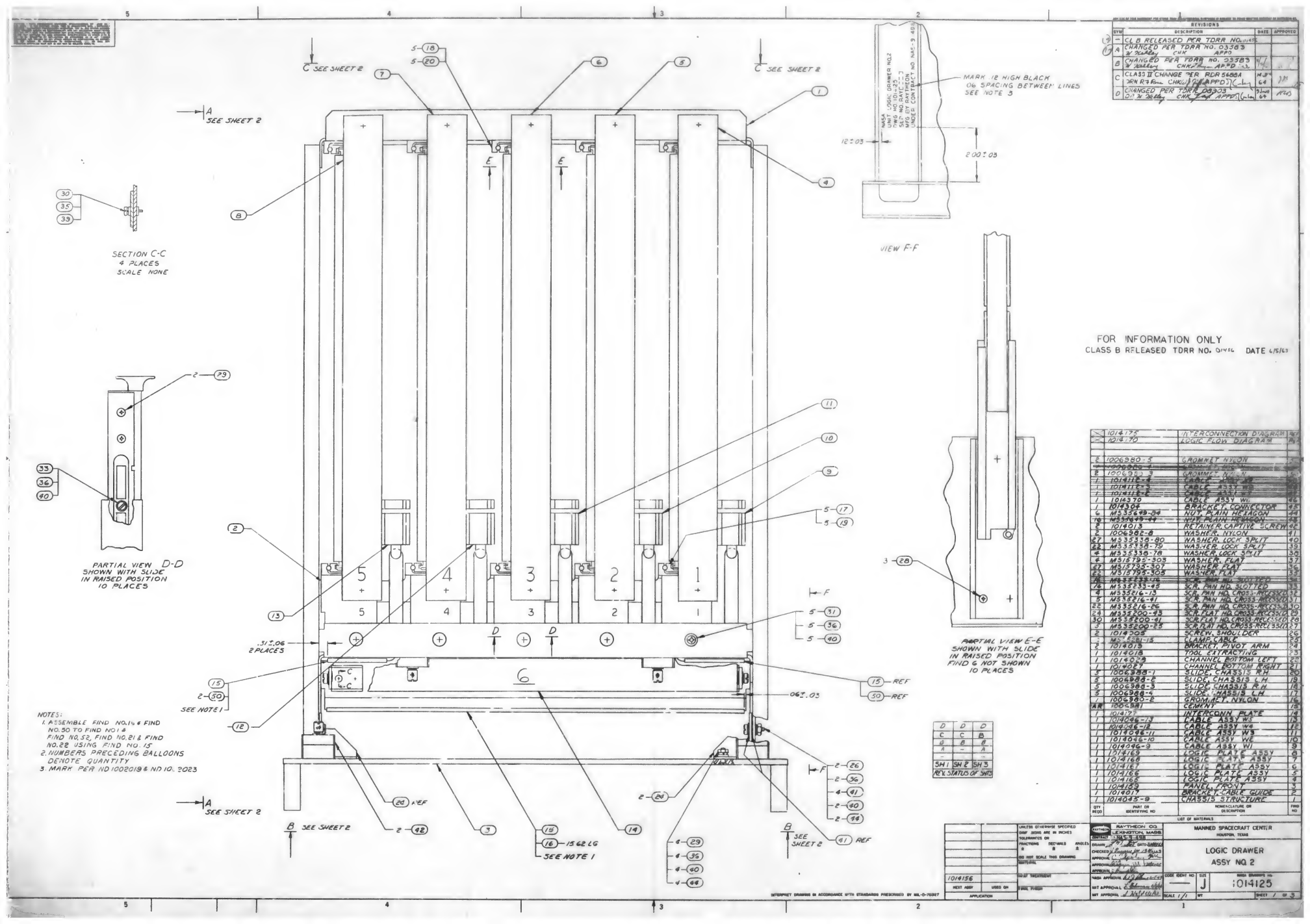
RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN DATE
CHECKED
APPROVAL
APPROVAL
NASA APPROVAL
QUIT APPROVAL
QUIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

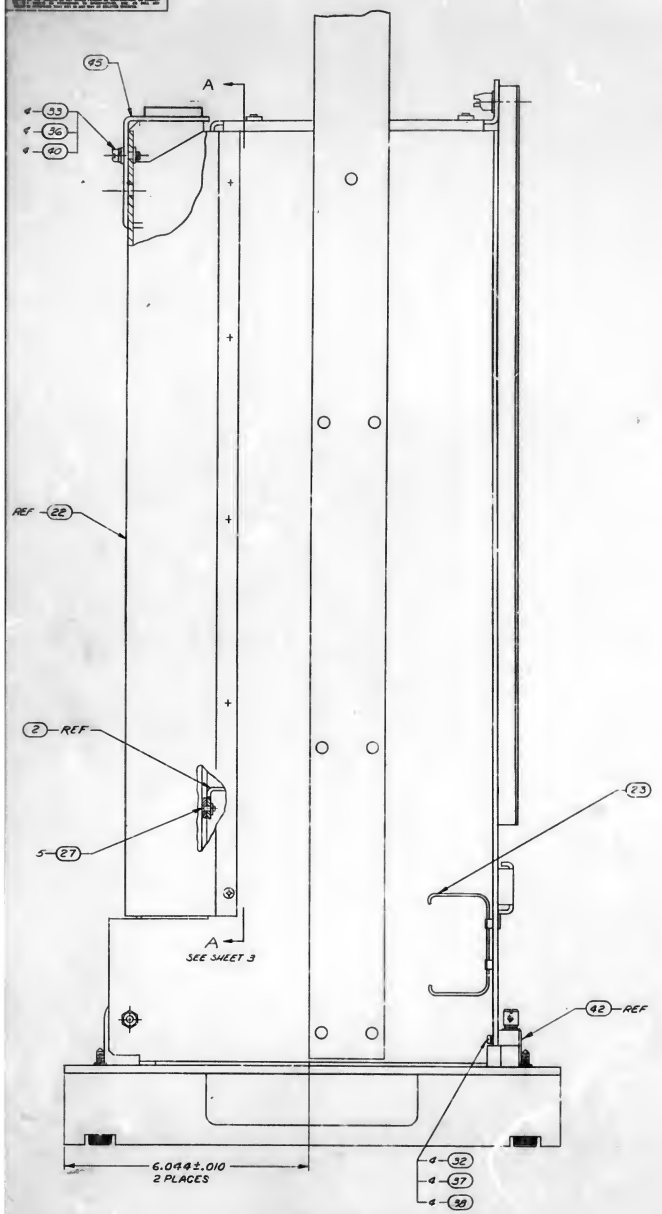
LOGIC DRAWER
ASSY NO. 1

CODE IDENT NO. | SIZE J | NASA DRAWING NO. 1014124
SCALE 1/1 | WT | SHEET 3 OF 3

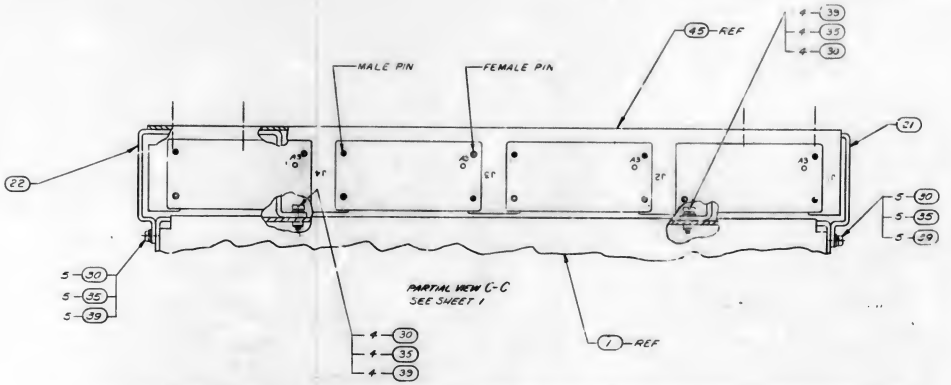
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327


REVISIONS
DTR
DESCRIPTION
DATE
APPROVED
- CL B RELEASED PER TDRR NO. 01145
A CHANGED PER TDRR NO. 03383 & SUBSEQ CHK APPD
B CHANGED PER TDRR NO. 03383 & SUBSEQ CHK'D APP'D
C CLASS II CHANGE PER RDR 5605A JAN R'S FROM CHK'D APP'D
D CHANGED PER TDRR 03933 & SUBSEQ CHK'D APP'D
SECTION C-C
4 PLACES
SCALE NONE
PARTIAL VIEW D-D
SHOWN WITH SLIDE
IN RAISED POSITION
10 PLACES
VIEW F-F
MARK .12 HIGH BLACK
06 SPACING BETWEEN LINES
SEE NOTE 3
12±.03
200±.03
PARTIAL VIEW E-E
SHOWN WITH SLIDE
IN RAISED POSITION
FIND 6 NOT SHOWN
10 PLACES
FOR INFORMATION ONLY
CLASS B RELEASED TDRR NO. 01145 DATE 4/15/63
.312±.06
2 PLACES
SEE NOTE 1
.062±.03
SEE NOTE 1
NOTES:
1. ASSEMBLE FIND NO. 14 & FIND NO. 50 TO FIND NO. 1 & FIND NO. 52, FIND NO. 21 & FIND NO. 22 USING FIND NO. 15
2. NUMBERS PRECEDING BALLOONS DENOTE QUANTITY
3. MARK PER ND 1002018 & ND 10-2023
SH 1 SH 2 SH 3
REV STATUS OF SH'S
1014172 INTERCONNECTION DIAGRAM
1014170 LOGIC FLOW DIAGRAM
2 1006980-5 GROMMET NYLON
2 1006980-4 GROMMET NYLON
2 1006980-3 GROMMET NYLON
1 1014116-4 CABLE ASSY W4
1 1014116-3 CABLE ASSY W3
1 1014116-2 CABLE ASSY W2
1 1014170 CABLE ASSY W1
1 1014304 BRACKET, CONNECTOR
6 MS35649-264 NUT PLAIN HEXAGON
10 MS35649-244 NUT PLAIN HEXAGON
2 1014013 RETAINER, CAPTIVE SCREW
2 1006982-8 WASHER, NYLON
67 MS35338-80 WASHER, LOCK SPLIT
22 MS35338-79 WASHER, LOCK SPLIT
4 MS35338-78 WASHER, LOCK SPLIT
4 MS15795-303 WASHER, FLAT
67 MS15795-307 WASHER FLAT
22 MS15795-308 WASHER, FLAT
76 MS35233-26 SCR, PAN HD, SLOTTED
76 MS35233-46 SCR, PAN HD, SLOTTED
4 MS35206-15 SCR, PAN HD, CROSS-RECESSED
5 MS35206-41 SCR, PAN HD, CROSS-RECESSED
22 MS35206-26 SCR, PAN HD, CROSS-RECESSED
24 MS35200-45 SCR, FLAT HD, CROSS-RECESSED
30 MS35200-41 SCR, FLAT HD, CROSS-RECESSED
5 MS35200-23 SCR, FLAT HD, CROSS-RECESSED
2 1014003 SCREW, SHOULDER
: MS3420W-13 CLAMP, CABLE
2 1014013 BRACKET, PIVOT ARM
1 1014018 TOOL, EXTRACTING
1 1014029 CHANNEL, BOTTOM LEFT
1 1014027 CHANNEL, BOTTOM RIGHT
5 1006988-1 SLIDE, CHASSIS R.H.
5 1006988-2 SLIDE, CHASSIS L.H.
5 1006988-3 SLIDE, CHASSIS R.H.
5 1006988-4 SLIDE, CHASSIS L.H.
1 1006980-2 GROMMET, NYLON
AR 1006981 CEMENT
1 1014171 INTERCONN PLATE
1 1014046-13 CABLE ASSY W13
1 1014046-12 CABLE ASSY W12
1 1014046-11 CABLE ASSY W11
1 1014046-10 CABLE ASSY W10
1 1014046-9 CABLE ASSY W9
1 1014169 LOGIC PLATE ASSY
1 1014168 LOGIC PLATE ASSY
1 1014167 LOGIC PLATE ASSY
1 1014166 LOGIC PLATE ASSY
1 1014165 LOGIC PLATE ASSY
1 1014163 PANEL, FRONT
1 1014017 BRACKET, CABLE GUIDE
1 1014042-9 CHASSIS STRUCTURE
QTY REQD
PART OR IDENTIFYING NO
NOMENCLATURE OR DESCRIPTION
FIND NO
LIST OF MATERIALS
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS DECIMALS ANGLES
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
1014156
NEXT ASSY
USED ON
APPLICATION
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NAS 9-153
DRAWN
CHECKED
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
1ST APPROVAL
1ST APPROVAL
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS
LOGIC DRAWER
ASSY NO. 2
CODE IDENT NO
SIZE J
1014125
SCALE 1/1
WT
SHEET 1 OF 3
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

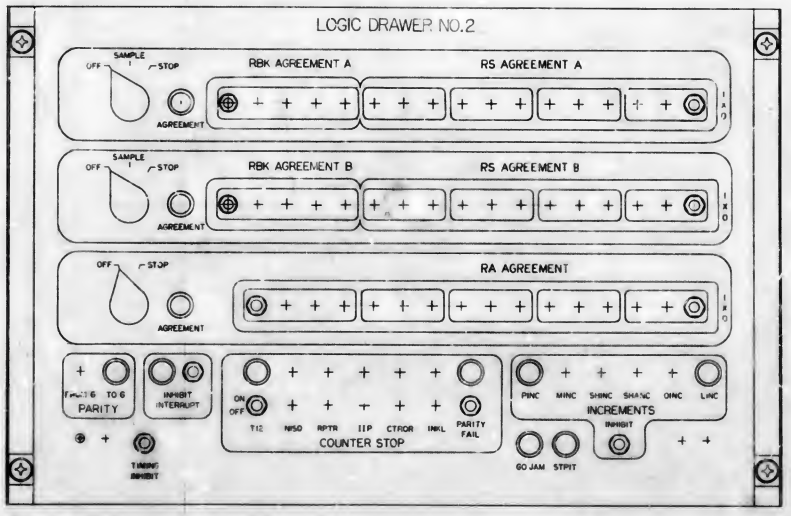
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
A	CL B RELEASED PER TDRR NO 03656		
B	CHANGED PER TDRR NO 03583		
C	CLASS II CHANGE PER NO A5C88A		
D	CHANGED PER TDRR 03903		



VIEW A-A
SEE SHEET 1



PARTIAL VIEW C-C
SEE SHEET 1



VIEW B-B
SEE SHEET 1

FOR INFORMATION ONLY
CLASS B RELEASED TDRR NO. 0.456 DATE 4/5/63

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NAS 9-151

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

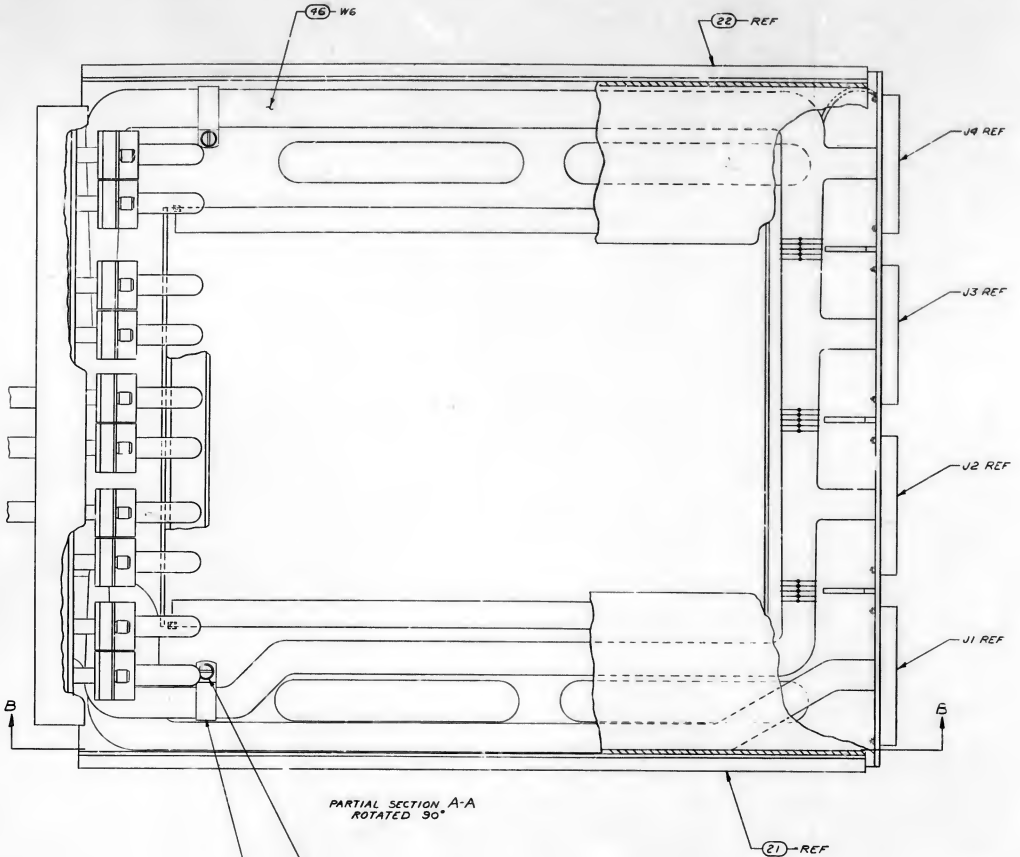
LOGIC DRAWER
ASSY NO. 2

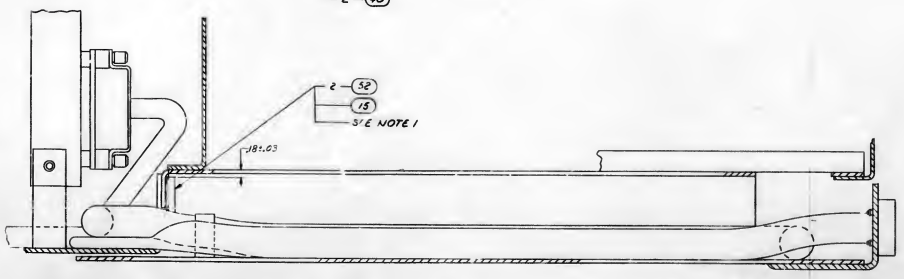
CODE IDENT. NO. J
SIZE
RMSA DRAWING NO. 1014125
SCALE 1/1
SHEET 2 OF 5

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES; TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES °
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY
USED ON
APPLICATION

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR NO 03583		WK
D	CHANGED PER TDRR 09303 DR N Kelley CHK APPD	9JUN65	RLD





PARTIAL SECTION B-B

FOR INFORMATION ONLY
CLASS B RELEASED TDRR NO DATE

② REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATL SPEC
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINISH
NEXT ASSY | USED ON
APPLICATION

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS-9-498

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

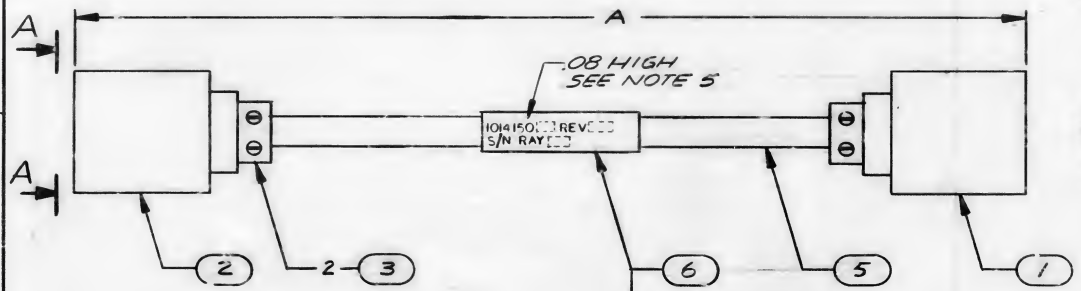
DRAWN [illegible] DATE 9JUN65
CHECKED [illegible]
APPROVED [illegible]
APPROVED [illegible]
NASA APPROVAL [illegible]
RAYTHEON APPROVAL [illegible]
NASA APPROVAL [illegible]

LOGIC DRAWER
ASSY NO 2

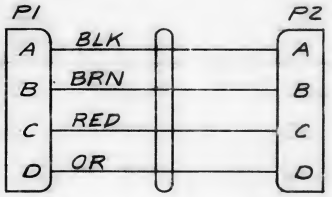
SIZE J
NASA DRAWING NO 1014125
SCALE 1/1
WT
SHEET 3 OF 3

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR NO. 01215		
A	CL II CHANGED PER RD R5228 DR L Judge CHK A. Perreault APPD	17 JUL 63	
B	CHANGED PER TDRR NO. 07850 DR S. DeFilice CHK Kuhl/Kenney APPD O'Mahoney	6 MAY 64	
C	CHANGED PER TDRR NO. 09773 DR R. Heindel CHK APPD	9 JUNE 64	
D	UPGRADE TO CLASS A WITH CHANGE PER TDRR 17230 DR P. Chesnis CHK Kuhl/Kenney APPD	30 MAY 65	



VIEW A-A



SCHEMATIC

PART NO.	REVISION STATUS OF ASSY.	DIM. A	TOL. ±
1014150-1	B	15 FT	2 IN.
-2	B	25 FT	4 IN.
-3	B	50 FT	6 IN.

NOTES

1. FOR FABRICATION SEE ND 1002032
2. ~~MIL-I-631 TYPE F, FORM U2 GRADE A CLASS I, CATEGORY I, AWG 7/8, COLOR WHT~~
3. ~~MARK .12 HIGH BLACK CHARACTERS PER ND 1002019~~ .
4. BOND USING FIND NO. 7
5. MARK GOTHIC CHARACTERS AS SHOWN PER ND1002019 AND SERIALIZE PER ND1002023 USING BLACK INK 1006256-001
6. SOLDER PER ND1002071

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
A/R	1006253	ADHESIVE	7
1	1014472-2A	BAND MARKER, CABLE	6
A/R	1006885	WIRE, ELECTRICAL	5
~~A/R~~	~~SEE NOTE 2~~	~~INSULATION, ELECTRICAL~~	~~4~~
2	MS3057-12A	CLAMP, CABLE	3
1	MS3106A-22-22P	CONNECTOR, PLUG, ELECTRIC	2
1	MS3106A-22-22S	CONNECTOR, PLUG, ELECTRIC	1

LIST OF MATERIALS

~~1021155~~	
1014156	
1014465	
1014217	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± .06 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS-9-498
DRAWN E. Podmoroff DATE 5 APR 63
CHECKED 30 APR 63
APPROVAL 5/1/63
APPROVAL 5/8/63
APPROVAL
NASA APPROVAL 5/8/63
MIT APPROVAL 5/8/63
MIT APPROVAL 8/4/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

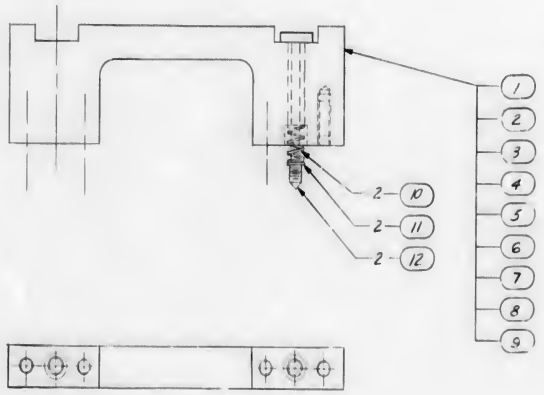
CABLE ASSEMBLY
AC LINE

CODE IDENT NO. —— SIZE C NASA DRAWING NO. 1014150
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1014150

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASE PER TDRR 01487	6-5-63	



FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 01487 DATE 6-5-63

NOTES:
1. NUMBERS PRECEDING BALLOONS DENOTE QUANTITY

-9	-8	-7	-6	-5	-4	-3	-2	-1	QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
2	2	2	2	2	2	2	2	2		1015828	SCREW	12
2	2	2	2	2	2	2	2	2		1015829	RETAINER	11
2	2	2	2	2	2	2	2	2		1015830	SPRING	10
1										1014293-9	HANDLE	9
	1									-8		8
		1								-7		7
			1							-6		6
				1						-5		5
					1					-4		4
						1				-3		3
							1			-2		2
								1		1014293-1	HANDLE	1

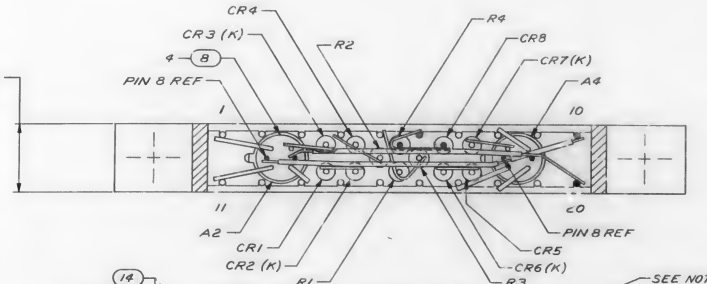
LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ± DO NOT SCALE THIS DRAWING MATERIAL HEAT TREATMENT FINAL FINISH	RAYTHEON CO LEXINGTON, MASS. CONTRACT NO. NAS 9-425 DRAWN DATE 2/5/63 CHECKED 2/14/63 APPROVAL APPROVAL APPROVAL NASA APPROVAL MIT APPROVAL MIT APPROVAL	MANNED SPACECRAFT CENTER HOUSTON, TEXAS HANDLE ASSY CODE IDENT NO — SIZE D NASA DRAWING NO 1014215 SCALE NONE WT SHEET 1 OF 1	
NEXT ASSY USED ON APPLICATION			

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

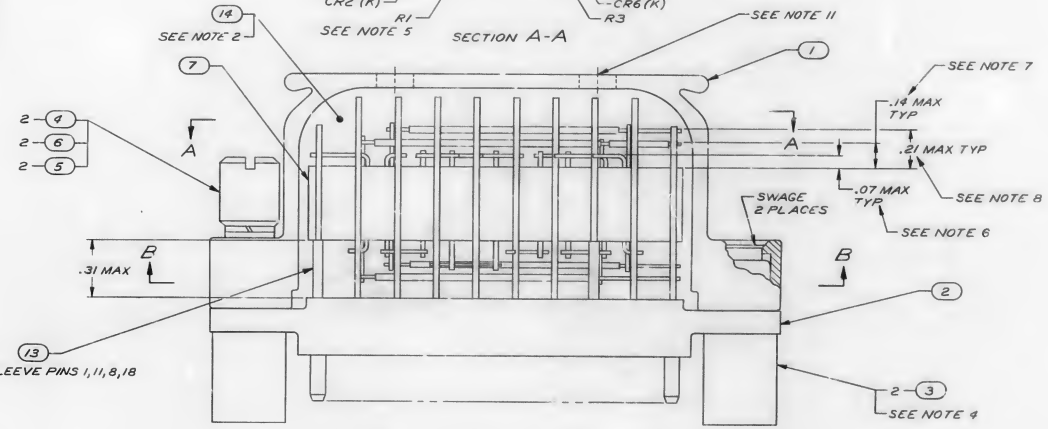
1014215

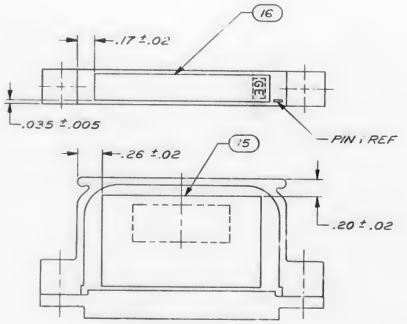
REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REPLACES REV A WITH CHANGE PER TDRR 0-782		



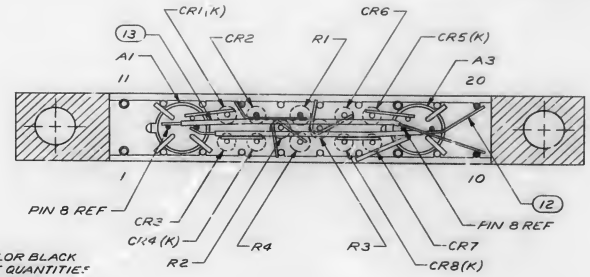
SECTION A-A

REF DESIGNATIONS	
SYMBOL	FIND NO.
R1, R2, R3, R4	9
CR1, CR2, CR3, CR4, CR5, CR6 CR7, CR8	10
A1, A2, A3, A4	11





MARKING VIEW
SCALE 2/1



SECTION B-B

NOTES
1. WIRE PER ND1002003
2. FILL WITH FIND NO. 14 PER ND1002183 COLOR BLACK
3. NUMBERS PRECEDING BALLOONS INDICATE QUANTITIES
4. SEE 1014047 FOR POSITIONING OF PROGRAM TABS
5. STAKE FIND NO. 9, 10 AND 11 TO FIND NO. 7 PER NDIC 02004
6. WHITE DOT INDICATES FIRST LEVEL WIRING
7. CROSS HATCHED DOT INDICATES SECOND LEVEL WIRING
8. BLACK DOT INDICATES THIRD LEVEL WIRING
9. UNUSED CONNECTOR LEADS MAY BE CUT FLUSH TO +.010 WITH UPPER SURFACE OF FIND NO. 2 AND EXCESSIVE LEAD HEIGHT A MIN OF .030 ABOVE HIGHEST WELD ON EACH LEAD
10. NO BARE WIRE OR COMPONENTS TO SHOW THRU POTTING
11. POTTING TO BE FLUSH OR BELOW TOP OF VENT HOLES OF FIND NO. 1

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. DATE

(B) REPLACES REV A WITH CHANGE

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
	1014231	SCHEMATIC	REF
1	1014199-8	DECAL, IDENTIFICATION	16
1	1014200-8	DECAL, IDENTIFICATION	15
A/R	1006904	EPOXY RESIN	14
A/R	1006776-20	INSULATION SLEEVING	13
A/R	1006757-1	WIRE, ELECTRICAL	12
4	1006771	MICROLOGIC NOR GATE	11
8	1006751	DIODE	10
4	1006750-39	RESISTOR 1/4 W, 2K, ±2%	9
4	1014069	TRANSIPAD-TO-47	8
1	1020076	MODULE INJECTION MOLDING	7
2	MS35337-79	WASHER, LOCK	6
2	1006997	WASHER, PLAIN FLAT	5
2	1006998-1	SCREW, CAPTIVE	4
2	1014032	RECEPTACLE, INDEXING	3
1	1014038	CONNECTOR, 20 PIN	2
1	1014000-1	FRAME, MODULE	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

1014156	1014307
NEXT ASSY	USED ON
APPLICATION	

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70127

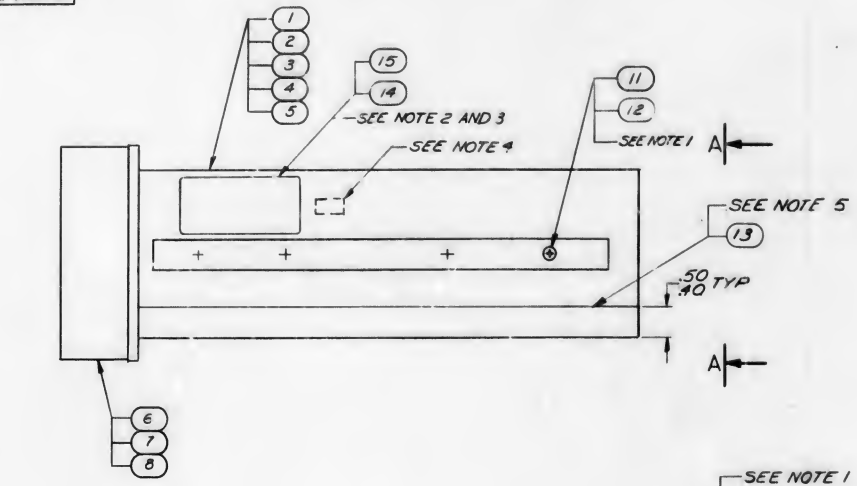
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-838
DRAWN R.E. Taylor DATE 12 OCT 68
CHECKED J. Dennis 29 OCT 68
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

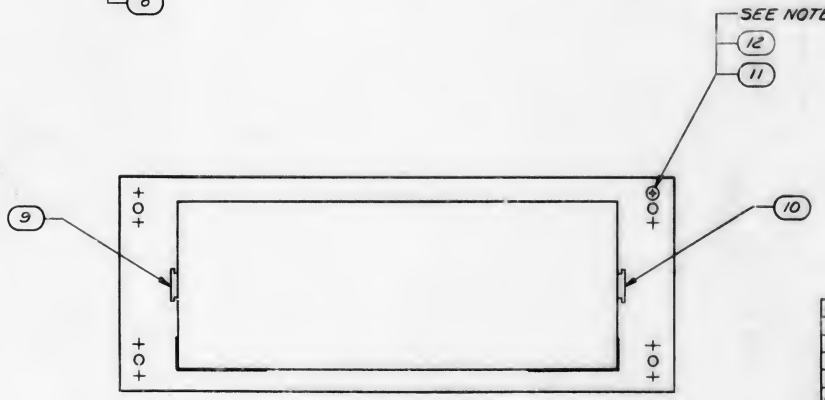
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

INTERFACE RECEIVER MODULE

CODE IDENT NO. —
SIZE F
NASA DRAWING NO. 1014230
SCALE 4/1
WT
SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
---	LL B RELEASE PER TDRR 01487	6-5-63	
A	CHANGED PER TDER 05679 L.A. Erickson CHK'D J. Hall APP'D [illegible]	1-20-64	
B	CHANGED PER TDRR 08124 OP B.Katinsky CHK'D Giggiano APP'D [illegible]	11MAY 64	
C	UPGRADE TO CL A WITH CHANGE PER TDRR 16297 B.Katinsky CHK'D [illegible] APP'D [illegible]	2 MAR 65	





VIEW A-A

REV STATUS OF ASSY	
PART NO.	REV SYM
1014303-1	B
1014303-2	B
1014303-3	B
1014303-4	B
1014303-5	B

NOTES:
1. ASSEMBLE FIND NO. 11 USING FIND NO. 12
2. ASSEMBLE FIND NO. 14 USING FIND NO. 15 APPROX WHERE SHOWN
3. STAMP .06 HIGH GOTHIC CHARACTERS PER ND1002019 & ND1002023
4. MARK APPROX WEIGHT IN LBS .25 HIGH GOTHIC CHARACTERS PER ND1002123 USING BLK INK 1006271-10 APPROX. WHERE SHOWN.
5. ASSEMBLE FIND NO. 13 TO BOTH SIDES OF UNITS AS SHOWN

QTY REQD -5	QTY REQD -4	QTY REQD -3	QTY REQD -2	QTY REQD -1	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
AR	AR	AR	AR	AR	MIL-C-4003	CEMENT	15
1	1	1	1	1	1020085	PLATE, IDENTIFICATION, APOLLO G & N	14
AR	—	AR	AR	—	1006692-4	TAPE, PRESSURE SENSITIVE ADHESIVE	13
AR	AR	AR	AR	AR	MIL-S-4008B, CL31	SEALING & RETAINING COMPOUND	12
4	16	4	8	8	MS 35200-42	SCREW, FLAT HEAD	11
—	1	—	—	—	1006930-2	SLIDE (L.H. CHASSIS SECTION)	10
—	1	—	—	—	1006930-1	SLIDE (R.H. CHASSIS SECTION)	9
—	—	—	2	—	1014215-5	HANDLE ASSY	8
—	2	—	—	2	1014215-3	HANDLE ASSY	7
2	—	2	—	—	1014215-2	HANDLE ASSY	6
1	—	—	—	—	1006963	CALIBRATOR FREQUENCY	5
—	1	—	—	—	1006961	RECEIVER, PHASE COMPARATOR	4
—	—	1	—	—	1006962	COUNTER, ELECTRICAL	3
—	—	—	1	—	1006965	DIGITAL RECORDER	2
—	—	—	—	1	1006959	DRAWER	1

LIST OF MATERIALS

1020344			
1014217			
NEXT ASSY	USED ON		
APPLICATION			

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-495
DRAWN G. Zocco DATE 2 MAR 65
CHECKED J.R. Ball 2 MAR 65
APPROVAL [illegible] 2 MAR 65
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible] 4/7/65
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

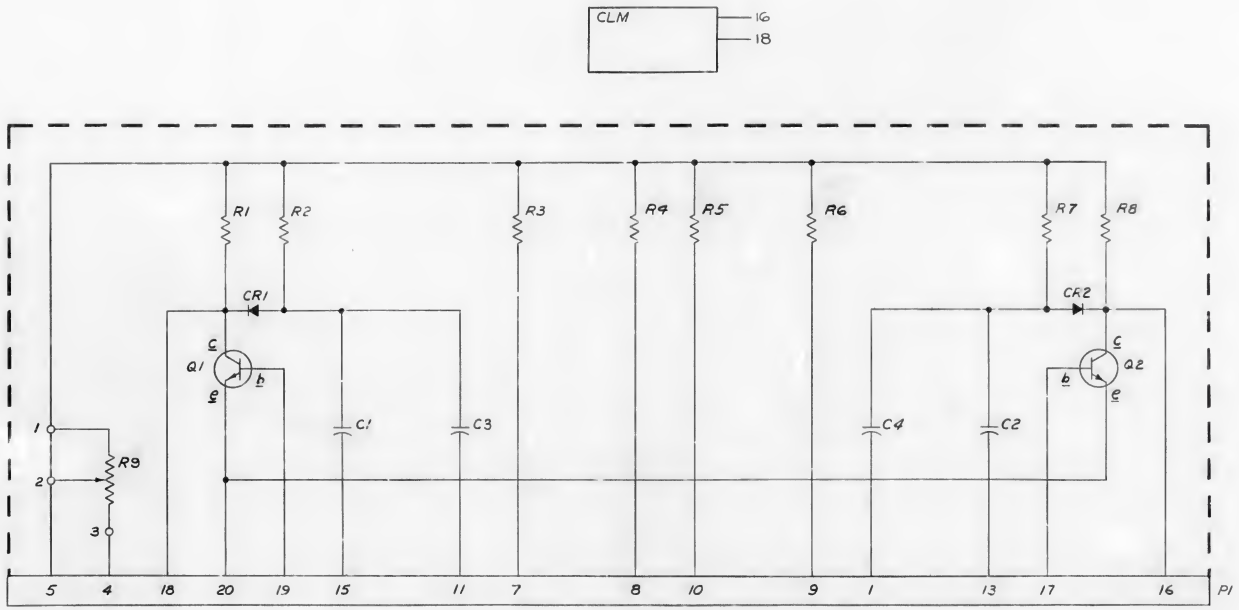
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

HANDLE – SLIDE ASSEMBLY CALIBRATION CONSOLE

CODE IDENT NO —
SIZE D
NASA DRAWING NO 1014303
SCALE NONE
WT
SHEET 1 OF 1

1014303

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
—	CLASS B RELEASED PER TDRR		



FREQ	PINS		B+ 10VDC PIN
60CPS	17,8,11	19,10,1	4
125 KC MIN	17,7,15	19,13,9	5

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO 02306 DATE 7 Jun 63

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING
C1	1006867	CAPACITOR	1500UUF	±5%	
C2	1006867		1500UUF	±5%	
C3	1006866		1.0UF	±10%	
C4	1006866	CAPACITOR	1.0UF	±10%	
CR1	1006751	DIODE			
CR2	1006751	DIODE			
P1	1014324	CONN			
Q1	1006752	TRANSISTOR			
Q2	1006752	TRANSISTOR			
R1	1006750-39	RESISTOR	2K	±2%	1/4W
R2	1006750-56		10K	±2%	1/4W
R3	1006750-63		20K	±2%	1/4W
R4	1006750-78		82K	±2%	1/4W
R5	1006750-78		82K	±2%	1/4W
R6	1006750-63		20K	±2%	1/4W
R7	1006750-56		10K	±2%	1/4W
R8	1006750-39	RESISTOR	2K	±2%	1/4W
R9	1006864	TRIM POT	1K	±20%	1/2W

NOTES

1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN PREFIX EACH REFERENCE DESIGNATION WITH UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH

REF DRAWING
MECHANICAL ASSEMBLY 1014226

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
		LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH
NEXT ASSY | USED ON
APPLICATION

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO. NAS 9-598
DRAWN W.J. Miller DATE 4 MAY 63
CHECKED R. Peters DATE 4 May 63
APPROVAL C. Sparkes DATE 5/9/63
APPROVAL [illegible] DATE 5/16/63
APPROVAL [illegible] DATE 5/16/63
NASA APPROVAL [illegible] DATE 5/17/63
MIT APPROVAL [illegible] DATE 5/17/63
MIT APPROVAL [illegible] DATE 5/17/63

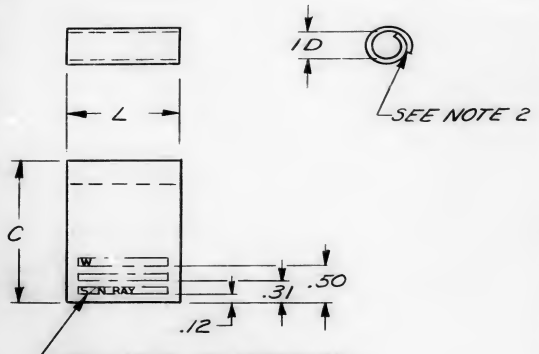
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CLOCK MODULE
SCHEMATIC DIAGRAM

CODE IDENT NO. —
SIZE D
NASA DRAWING NO 1014328
SCALE NONE
WT
SHEET 1 OF 1

1014328

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
	CL B RELEASE PER TDRR		



DASH NO.	DIMENSIONS		
	L	ID	C
-1	1.75	.38	1.50
-2	↑	.50	1.88
-3		.62	2.25
-4		.75	2.69
-5		.88	3.06
-6		1.00	3.44
-7		1.12	3.81
-8		1.25	4.25
-9		1.38	4.63
-10		1.50	5.06
-11		1.75	5.81
-12		2.00	6.62
-13		2.25	7.38
-14		2.50	8.19
-15		2.75	8.94
-16	↓	3.00	9.75
-17	1.75	3.25	10.50
-18	1.75	3.50	11.31
-19	1.75	.150	.88

FOR INFORMATION ONLY

CLASS B RELEASE TDRR NO. 034 31 DATE 26 Sep 63

NOTES

1. MATL: YELLOW POLYVINYL CHLORIDE WITH A MATTE FINISH PER MIL-F-10400A
2. MARK .08 HIGH BLACK PER ND1002019

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
		LIST OF MATERIALS	

1014370	1014156
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ±.02 ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE 1
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS 9-498

DRAWN A. Force DATE 4 AUG 63
CHECKED A. Morrison 2 SEPT 63
APPROVAL E. Lovelace OK
APPROVAL J. Levin 9/3/63
APPROVAL J. Saunders 9/4/63
NASA APPROVAL Mitchell 9/4/63
MIT APPROVAL S. Nagel 9/5/63
MIT APPROVAL D. Solomon 9/5/63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

BAND MARKER, CABLE

CODE IDENT NO.	SIZE	NASA DRAWING NO.
—	C	1014472
SCALE NONE	WT	SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

NOTES:

1. THIS DRAWING DEFINES TOTAL G & N SYSTEMS IN TERMS OF IDENTIFIABLE, SEPARATELY INSTALLED, PIECES OR SEPARATE PARTS.
2. NUMBER IN PARENTHESIS FOLLOWING A PART NUMBER INDICATES QUANTITY OF THAT PART.
3. OUTSTANDING ECP'S ARE THOSE THAT HAVE BEEN APPROVED, BUT NOT INCORPORATED. PART NUMBERS REFLECT CONFIGURATION CHANGES AS A RESULT OF INCORPORATED ECP'S.
4. PARTS REMOVED FROM FIND NUMBERS 2, 25, 32, 37, 58, 67 76, 106, 150 AND 151 FOR SHIPPING AND/OR INSTALLATION ARE LISTED IN TABLE I.
5. CLAMP SIZES SELECTED TO CONFORM TO BUNDLE DIAMETERS. 2 CLAMPS, 1010400-4 (FIND NO. 108), ARE FURNISHED AS PART OF THE AIRBORNE VIBRATION ASSY FOR G & N 17.
6. OPTIONAL EQUIPMENT FOR USE WITH OPTICAL UNIT.
7. THE FOLLOWING INCORPORATED ECP'S DO NOT REFLECT PART NUMBER CHANGES. PART NUMBERS WILL BE CHANGED AS SOON AS THIS INFORMATION IS AVAILABLE : NONE.
8. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.
9. REQUIRED FOR THERMAL VACUUM TEST.
10. K START TAPE ASSEMBLY FOR USE AT NAA. USE REVISION INDICATED.
11.
12. K START TAPE ASSEMBLY FOR USE AT KSC. USE REVISION INDICATED.
13. K START TAPE ASSEMBLY FOR USE AT MSC. USE REVISION INDICATED.
14. THE PARTS LISTED IN COLUMN "B" OF TABLE II ARE TO BE REMOVED FROM THE ASSEMBLY LISTED IN COLUMN "A" PRIOR TO S/C INSTALLATION. THE PARTS REMOVED ARE TO BE RETAINED WITH THE G & N SYSTEM FOR REUSE IN THE EVENT OF REMOVAL OF FIND NO 35 OR 76 FROM THE S/C.
15. THE CONFIGURATION OF THESE SYSTEMS WILL NO LONGER BE MAINTAINED

FIND NO.	NOMENCLATURE OR DESCRIPTION	ITEMS REMOVED FOR SHIPPING AND/OR INSTALLATION
151	CASE AND PANEL ASSY CDU	154 THRU 162
150	COUPLING DISPLAY ASSY	150 THRU 153
32	WIRING HARNESS, AGC TO PSA/G&N TO SC	99
106	AIRBORNE VIBRATION ASSY	107 THRU 115
58	G&N INDICATOR & CONTROL PANEL ASSY	65 AND 66
76	NAV BASE & OPTICAL UNIT ASSY	77 THRU 96
67	AGE HARNESS & PSA END CONNECTOR ASSY	68 THRU 75
37	CDU FRAME ASSY	41 AND 42
25	AGC NAV DSKY	26 THRU 30
2	APOLLO GUIDANCE COMPUTER	3 THRU 24

TABLE I (SEE NOTE 4)

FIND NO. (COLUMN A)	NOMENCLATURE OR DESCRIPTION	PART NUMBER	QTY
76	IMU MOUNTING PADS	1899960	1
	IMU MOUNTING PADS	1899959	1
	IMU MOUNTING PADS	1899958	1
	IMU MOUNTING PADS	1899957	1
35	PROTECTIVE PADS	1001465	1
	PROTECTIVE PADS	1001464	1
	PROTECTIVE PADS	1001461	1
	PROTECTIVE PADS	1001460	1
	COLUMN B		

TABLE II (SEE NOTE 14)

	1000110-307	1000110-307	1000110-307	1000110
	1001591	1001591	1001591	1001591
	1000293	1000293	1000293	1000293
	1001469	1001469	1001469	1001469
	1001470	1001470	1001470	1001470
	1010400-5	1010400-5	1010400-5	10104
	1007585-011	1007585-011	1007585-011	100758
	2011788	2011788	2012691	2011788
	2012667	2012667	2012667	2011734
	2012699	2012699	2012699	2011786
	2012700	2012700	2012700	2011932
	2012719	2012719	2012719	2011960
	1011625-39 (5)	1011625-39 (5)	1011625-39 (5)	1011625
	1021407-011	1021407-011	1021407	1021407
	1899994-011	1899994-011	1899994-011	18999
	AN 960 C 516 L	AN 960 C 516 L	AN 960 C 516 L	AN 960
	1010728-001	1010728-001	1010728-001	101072
	1899975	18999	1899975	1899975
	1010827	1010827	1010827	1010827
	1899971	1899971	1899971	1899971
	1010828	1010828	1010828	10108
	1899997-002	1899997-002	1899997-002	1899997
	1899997-001	1899997-001	1899997-001	1899997
	1899980	1899980	1899980	18999
	1899978	1899978	1899978	189997
	1899974	1899974	1899974	1899974
	1899950-341	1899950-331	1899950-291	1899950
				114609
	1010705-6	1010705-6	1010705-6	1010705
	1010705-8 (2)	1010705-8 (2)	1010705-8 (2)	1010705
				1010400
				1010400
	1010400 (10)	1010400 (10)	1010400 (10)	1010400
				1010400
				1010400
	1015086-011	1015086-011	1015086-011	1015086
	2014764-021	2014764-021	2014764-021	1023001
	2014764-011	2014764-011	2014764-011	1023001
	1021373-041	1021373-041	1021373-031	
	1014532	1014532	1014532	1014532
	1014502-021	1014502-021	1014502-021	101450
	1015064-021	1015064-021	1015064-031	1015064
	1014628-021	1014628-021	1014628-021	1014628
	1015065-091	1015065-091	1015065-091	1015065
	1014664-031	1014664-031	1014664-031	1014664
	1008591	1008591	1008591	1008591
	1007220	1007220	1007220	1008535
	1007580-021	1007580-021	1007580-021	1007580
	1007579-021	1007579-021	1007579-021	100757
	1007578-031	1007578-031	1007578-021	100757
	1007593-011	1007593-011	1007593-011	1007593
	1007577-031	1007577-031	1007577-031	1007577
	1007576-021	1007576-021	1007576-031	1007576
	1007575-031	1007575-031	1007575-031	100757
	1007574-031	1007574-031	1007574-031	1007574
	1007573-031	1007573-031	1007573-031	100757
	1007572-041	1007572-041	1007572-041	100757
	1007571-031	1007571-031	1007571-031	100757
	1007570 041	1007570-041	1007570-031	100757
				AN 365
				101688
				1015500
				1015500
				101753
				101680
				1016903
	1001500-111	1001500-111	1001500-091	100150
	1007700-051	1007700-051	1007700-051	
	1004866-011	1004866-011	1004866-011	1004866
	1003563-051	1003563-051	1003563-051	1003563
	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337
	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795
	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995
	1004669	1004669	1004669	1004669
	1004670	1004670	1004670	1004670
	1003706-051	1003706-051	1003706-051	1003706
	1004730	1004730	1004730	1004730
	1003734	1003734	1003734	1003734
	1004728	1004728	1004728	1004728
	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795
	1010630-40	1010630-40	1010630-40	1010630
	1010630-39	1010630-39	1010630-39	1010630
	1004783	1004783	1004783	1004783
	1003730	1003730	1003730	1003730
	1003735	1003735	1003735	1003735
	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996
	MS 16996-13	MS 16996-13	MS 16996-13	MS 16996
	1003700-071	1003700-051	1003700-051	1003700-
OUTSTANDING ECP'S	842			
CONFIGURATION DASH NO.	-121	-111	-101	-07
G & N SYSTEMS	123	122	121	10
REMARKS				

1014999 CC 1 OF 2

-121	-111	-101	-071	-091	-081	-051	-041	-061	-031	-021	-011	-000	QTY	NOMENCLATURE OR DESCRIPTION	REMARKS	EQUIP CODE	FIND NO.
123	122	121	109	111	110	17	12	20	8	7	6	5					
													1	CLAMP, HINGED LOOP			109
							1010400-4						2	CLAMP, HINGED LOOP			108
							2007208						1	AIRBORNE AMPLIFIER PLATE ASSY			107
							2018899						1	AIRBORNE VIBRATION ASSY	SEE MODIFICATION 5465		106
1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1000110-307	1	FLIGHT-DATA BOOK		55	105
1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1001591	1	SCREW, SOC HD		55	104
1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1000293	1	BRACKET ASSY-COOLANT		55	103
1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1001469	1	CLAMP, COOLANT LINE		55	102
1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1001470	1	HOSE ASSY, FLEX, OPT TO S/C		55	101
1010400-5	1010400-5	1010400-5	1010400-5	1010400-5	1010400-7	1010400-5	1010400-5	1010400-5	1010400-5	1010400-7	1010400-7	1010400-7	1	HOSE ASSY, FLEX, IMU TO S/C		55	100
1007585-011	1007585-011	1007585-011	1007585-011	1007585-011	1007585-011	1007585-011							1	CLAMP, HINGED LOOP		55	99
														TRACKER X & Y ASSY		55	98
																	97
2011788	2011788	2012691	2011788	2011788	2011788	1011788	2012691	1011788	1011788	1011788	1011788	1011788	1	LONG EYE RELIEF EYEPIECE 3CT	SEE NOTE 6	65	96
						1011787		1011787	1011787	1011787	1011787	1011787	1	LONG EYE RELIEF EYEPIECE 5XT	SEE NOTE 6	65	95
2012667	2012667	2012667	2011734	2011734	2011734	1011734-001	1013010	1011734-001	1011734-000	1011734-000	1011734-000	1011734-000	1	SCT PRISM HOUSING ASSY		65	94
2012699	2012699	2012699	2011786	2011786	2011786	1011786-001	2012699	1013009	1011786-000	1011786-000	1011786-000	1011786-000	1	SXT MIRROR HOUSING ASSY		65	93
2012700	2012700	2011932	2011932	2011932	2011932	1011932	2012700	1011532	1011932	1011932	1011932	1011932	1	SXT EYEPIECE ASSY		65	92
2012719	2012719	2012719	2011960	2011960	2011960	1011960-001	2012719	1011960-001	1011960-000	1011960-000	1011960-000	1011960-000	1	SCT EYEPIECE ASSY		65	91
1011625-39 (5)	1011625-39 (5)	1011625-39 (5)	1011625-39 (5)	1011625-39 (5)	1011625-39 (5)	NAS1352 C06-8	NAS1352 C06-8	NAS1352 C06-8	NAS1352 C06-8	NAS1352 C06-8	NAS1352 C06-8	NAS1352 C06-8	4	SCREW, SOC HD CAP		65	90
1021407-2	1021407-011	1021407	1021407	1021407	1021407	1021414	1021414	1021414	1021414	1021414	1021414	1021414	1	ADAPTER PLATE ASSY COOLANT HOSE BY PASS		65	89
1899994-111	1899994-011	1899994-011	1899994-011	1899994-011	1899994-011	1899994-011	1899994-011	1899994-011	1899904-011	1899904-011	1899994-011	1899994-011	2	FRONT ISOLATOR LOCKOUT PIN ASSY		65	88
AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	AN 960 C 516L	6	WASHER, FLAT		65	87
1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	1010728-001	NAS 145-11	2	BOLT, HEX HD		65	86
1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1899975	1	SNUBBER, REAR (INSEPARABLE) ASSY		65	85
1010827	1010827	1010827	1010827	1010827	1010827	1010827	1899969	1899969	1899969	1899969	1899969	1899969	1	MOUNT, RESILIENT, REAR		65	84
1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	1899971	6	SPRING, SEAL RETAINING		65	83
1010828	1010828	1010828	1010828	1010828	1010828	1010828	1899970	1899970	1899970	1899970	1899970	1899970	2	MOUNT, RESILIENT FRONT		65	82
1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899997-002	1899954-102	1	SEAL, SXT BELLOWS		65	81
1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899997-001	1899954-001	1	SEAL, SCT, BELLOWS		65	80
1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	1899980	3	BOLT, HEX HD		65	79
1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1899978	1	SNUBBER, FRONT, RH ASSY (INSEPARABLE) ASSY		65	78
1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1899974	1	SNUBBER, FRONT, LH ASSY (INSEPARABLE) ASSY		65	77
1899950-341	1899950-339	1899950-091	1899950-081	1899950-071	1899950-071	1899950-251	1899950-271	1899950-261	1899950-021	1899950-021	1899950-021	1899950-011	1	NAV BASE AND OPTICAL UNIT ASSY	SEE NOTE 4 (4)	65	76
		1014609	1014609	1014609					1014609	1014609	1014609	1014609	1	BRACKET CLAMP (INSEPARABLE ASSY)		56	75
1010705-6	1010705-6	1010705-6	1017705-6	1010705-6									1	CLAMP LOOP		56	74
1010705-8 (2)	1010705-8 (2)	1010705-8 (2)	1010705-8	1010705-8	1010705-8	1010705-8 (2)	1010705-8 (2)	1010705-8 (2)	1010705-8 (2)	1010705-8 (2)	1010705-8	1010705-8	1	CLAMP LOOP		56	73
		1010400-8	1010400-8	1010400-8					1010400-8	1010400-8	1010400-8	1010400-8	1	CLAMP, HINGED LOOP		56	72
		1010400-7	1010400-7	1010400-7	1010400-7				1010400-7	1010400-7	1010400-7	1010400-7	1	CLAMP, HINGED LOOP		56	71
1010400 (10)	1010400 (10)	1010400 (10)	1010400-3	1010400-3	1010400-3	1010400 (8)	1010400 (10)	1010400 (10)	1010400-3	1010400-3	1010400-3	1010400-3	3	CLAMP, HINGED LOOP	SEE NOTE 5	56	70
		1010400-2	1010400-2	1010400-2					1010400-2	1010400-2	1010400-2	1010400-2	1	CLAMP, HINGED LOOP		56	69
		1010400-1	1010400-1	1010400-1					1010400-1	1010400-1	1010400-1	1010400-1	5	CLAMP, HINGED LOOP		56	68
1015086-011	1015086-011	1015086-031	1012086-000	1015086-021	1015056-021	1015056-031	1014606-041	1014606-051	1014606		1014606	1014606	1	AGE HARNESS ANO PSA END CONNECTOR ASSY	SEE NOTE 4	56	67
2014764-021	2014764-021	2014764-021	1023002-002	2014764-021	2014764-021	2014764-021							1	LONG HANDLE, G&N PANEL		50	66
2014764-011	2014764-011	2014764-011	1023002-001	2014764-011	2014764-011	2014764-011							1	SHORT HANDLE, G&N PANEL		50	65
1021373-041	1021373-041	1021373-031				1021373-011	1021373-021	1021373-011					1	APTPS		65	64
1014532	1014532	1014532	1014532	1014532	1014532	1023080-011	1014532	1014532	1014532	1014532	1014532	1014532	1	OPTICS COVER ASSY		50	63
1014502-121	1014502-021	1014502-021	1014502-021	1014502-021	1014502-021	1014502-011	1014502-021	1014502-021	1014502-011	1014502-011	1014502-011	1014502-011	1	OPTICS SHROUD ASSY		50	62
1015064-121	1015064-021	0150064-031	1015064-021	1015064-021	1015064-021	1015064-011	1015064-011	1015064-011	1015003	1015003	1015003	1015003	1	CONTROL ELECTRONICS ASSY		50	61
1014628-121	1014628-021	1014628-021	1014628-021	1014628-021	1014628-021	1015095-011	1014628-021	1014526-011	1014526-011	1014526-011	1014526-011	1014526-011	1	IMU CONTROL PANEL ASSY		50	60
1015065-091	1015065-091	1015065-091	1 5065-041	1015065-091	1015065-101	1015065-051	1015065-081	1015065-031	1007059	1007059	SK 44633	SK 44633	1	D&C ELECTRONICS ASSY		50	59
1014664-131	1014664-031	1014664-031	1014664-011	1014664-021	1014664-021	1015055-011	1015053-021	1014578-041	1014578-011	1014578-011	1014578-011	1014578-011	1	G&N INDICATOR AND CONTROL PANEL ASSY	SEE NOTE 4	50	58
																	57
1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	1008591	6	SCREW REWORKED		45	56
1007220	1007220	1007220	1008535	1008535	1007220	1008535	1007220	1008135	1008135	1008135	1008135	1008135	1	TOE CAP		45	55
1007580-121	1007580-021	1007580-021	1007580-011	1007580-011	1007580-011	1007256-031	1007256-021	1007160	1007160	1007160	1007256-011	1007256-011	1	TRAY 10		45	54
1007579-121	1007579-021	1007579-021	1007579-011	1007579-011	1007579-021	1007459-011	1007459-021	1021229-011	1007179	1007159	1007159	1007159	1	TRAY 9		45	53
1007578-131	1007578-031	1007578-021	1007578-011	1007578-021	1007578-021	1007458-011	1007458-021	1021228-011	1007178	1007271	1007158	1007158	1	TRAY 8		45	52
1007593-141	1007593-041	1007593-041	1007593-011	1007593-011	1007593-011	1007163	1007163	1007163	1007163	1007163	1007163	1007163	1	SHORTING PLUG		45	51
1007577-131	1007577-031	1007577-031	1007577-011	1007577-011	1007577-031	1007577-021	1007577-041	1021227-011	1007177	1007270	1007157	1007157	1	TRAY 7		45	50
1007576-121	1007576-021	1001576-031	1001576-011	1007576-011	1007576-021	1007456-021	1007456-031	1021226-011	1007176	1007269	1007156	1007156	1	TRAY 6		45	49
1007575-131	1007575-031	1001575-031	1001575-011	1007575-011	1007575-031	1007575-021	1007575-041	1021225-011	1007175	1007268	1007155	1007155	1	TRAY 5		45	48
1001574-131	1007574-031	1007574-031	1007574-011	1007574-011	1007574-031	1007574-021	1007574-041	1021224-011	1007262	1007262	1007154	1007154	1	TRAY 4		45	47
1007573-131	1007573-031	1007573-031	1007573-011	1007573-011	1007573-031	1007573-021	1007573-041	1021223-011	1007260	1007260	1007153	1007153	1	TRAY 3		45	46
1007572-141	1007572-041	1007572-041	1007572-011	1007572-011	1007572-041	1007572-031	1007572-051	1021222-011	1007152	1007152	1007152	1007152	1	TRAY 2		45	45
1007571-131	1007571-031	1007571-031	1007571-011	1007571-011	(GO7571-021	1007571-041	1021221-011	1007151	1007151	1007151	1007151	1007151	1	TRAY 1		45	44
1007570-141	1007570-041	1007570-041	1007570-011	1007570-011	1007570-021	1007257-051	1007257-061	1007257-031	1007170	1007267	1007100	1007257-011	1	POWER AND SERVO ASSY	REFERENCE	45	43
		AN 365 D-440	AN 365 D-440			AN 365 D-440		AN 3650-440	AN 365 D-440	AN 365 D-440	AN 365 D-440	AN 365 D 440	10	NUT, SPECIAL STUD		40	42
		1016889	1016889			1016889		1016889	1016889	1016889	1016889	1016889	10	STUD, SPECIAL		40	41
		1015500-031	1015500-031			015500-061 (3)							2	CDU ASSY		40	40
		1015500-021 (3)	1015500-021 (3)			1015500-021 (2)							5	CDU ASSY		40	39
		1017538-021	1017538-021			1017538-021		1015500-011	1017538-011	1017538-011	1017538-011	1017538-011	1	CDU PANEL ASSY		40	38
		1016885-021	1016885-021			1016885-031		IC-6908-021	1016885-011	1016885-011	1016885-011	1016885-011		CDU FRAME ASSY	SEE NOTE 4	40	37
		1016903-031	1016903-031			1016903-051		1016915-031	1016903-011	1016903-011	1016903-011	1016903-011		CDU AND PANEL ASSY	REFERENCE	40	36
1001500-111	1001500-111	1001500-091	1001500-091	1001500-081	1001500-081	1001500-011	1001500-091	1001429	1000201	1000201	1000201	1000201	1	IMU ASSY	SEE NOTE 14	55	35
1007700-151	1007700-051	1007700-051				1007700-011	1007700-041	1007121	1007121	1007121	1007121	1007121	1	SIGNAL CONDITIONER ASSY		30	34
						1012136-011		1012136	1012136	1012136	1011559	1011559	1	MAP AND DATA VIEWER		15	33
1004866-011	1004866-011	1004866-011	1004866-011	1004866-011	1005707-021	1005785-011	1005785-011	1005785-011	1005707-011	1005707-021	1005707-021		1	WIRING HARNESS, AGC TO PSA/G&N TO SC	SEE NOTE 4	55	32
1003563-051	1003563-051	1003563-021	1003563-031	1003563-031	1003564-041	1003564-021	1003564-051	1003540-MD1	1003564-011	1003564-011	1003564-011		1	MAIN DSKY		55	31
MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80 (4)	MS 35337-80	MS 35337-80	5	WASHER, LOCK		5	30
MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807 (4)	MS 15795-807	MS 15795-807	2	WASHER, FLAT		5	29
MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26 (4)	MS 16995-26	MS 16995-26	MS 16995-26	MS 16995-26	MS 16995-26	2	SCREW, SOC HD		5	28
1004669	1004669	1004669	1004669	1004669	1004669	1004669	1004669	1004609	1004609	1004609	1004609	1004609	1	FLANGE		5	27
1004670	1004670	1004670	1004670	1004670	1004670	1004670	1004670	1004607	1004607	1004607	1004607		1	BRACKET ANGLE		5	26
1003706-051	1003706-051	1003706-051	1003706-031	1003706-031	1003577-021	1003570-011	1003706-051	1003570-021	1003574 MD1	1003524 MD1	1003458 MD1	1003458 MD1		ASC NAV DSKY	SEE NOTE 4	5	25
1004730	1004730	1004730	1004730	1004730	1004730	1004730	1004730	1004730	1004733	1004733			1	GASKET, 360 PIN CONNECTOR		5	24
1003734	1003734	1003734	1003734	1003734	1003734	1003734	1003734	1003734	1003734	1003734			1	FRONT PANEL MOUNT ASSY, LEFT SIDE		5	23
1004728	1004728	1004722P	1004728	1004728	1004728	1004728	1004728	1004728	1004728	1004728			1	SHIELD, STANDBY SWITCH, AGC		5	22
MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	MS 15795-808	2	WASHER, FLAT		5	21
1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40	1010630-40		8	SCREW, FLAT HD HEX SOC		5	20
1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39	1010630-39		2	SCREW, FLAT HD HEX SOC		5	19
1004783	1004783	1004783	1004783	1004783	1004285	1004783	1004783	1004783	1004783	1004723	1004723		1	FRONT CLOSE OUT PANEL		5	18
1003730	1003730	1003730	1003730	1003730	1003730	1003730	1003730	1003730	1003730	1003730			1	SUPPORT FRONT PANEL		5	17
1003735	1003735	1003735	1003735	1003735	1003735	1003735	1003735	1003735	1003735	1003735			1	FRONT PANEL MOUNT ASSY, RIGHT SIDE		5	16
MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10	MS 16996-10			4	SCREW, SOC HD HEX		5	15
MS 16996-13	MS 16996-13	MS 16996-13	MS 16996-13	MS 16996-13	MS 16996-13	#516996-13	MS 16996-13	MS 16996-13	MS 16996-13				2	SCREW, SOC HD HEX		5	14
												1003457	1	AGC CONN COVER PLATE		5	13
												1003180	1	AGC TOE PLATE		5	12
											1010630-38	1010630-38	4	SCREW, FLAT HD HEX SOC		5	11
											AN 104608	AN 104608	4	SCREW, HEX HD		5	10
											AN 104606	AN 104636	4	SCREW, HEX HD		5	9
											1004272	1004272	4	BRACKET, COMP END CONN UPPER BPACE		5	8
											1010630-58	1010630-58	16	SCREW, FLAT HD HEX SOC		5	7
											1003489-011	1003189	1	AGC END CONNECTOR ASSY		5	6
											1003197-011	1003197	1	G&N HARNESS TRAY ASSY		5	5
											1003493-011	1003184	1	MEMORY TRAY B ASSY		5	4
											1003488-011	1003187	1	LOGIC TRAY A ASSY		5	3
1003700-071	1003700-051	1003700-051	1003700-051	1003700-051	1003700-051	1003565-041	1003565-071	1003700-071	1003565-031	1003700-011	1003700-011	1003496-011 MD1	1	APOLLO GUIDANCE COMPUTER	SEE NOTE 4	5	2
												1003186 MD2					1

SEE NOTE 15

ZONE	LTR	REVISIONS DESCRIPTION	CHG NO	DATE	APPROVED
F	BW	REPLACES REV BV WITH CHANGE PER TDRR 32946		MAY 67	AC
—	BY	REVISED PER TDRR 33931		JUN 67	AC
A	BZ	REVISED PER TDRR 34123		JUL 67	AC
	CA	REVISED PER TDRR 34589		SEP 67	AC
	CB	REVISED PER TDRR 35017	—	NOV 67	AC
	CC	REVISED PER TDRR 35668		JAN 68	AC

		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON X PLACE .X PLACE DECIMALS DECIMALS ANGLES ± ± ±	MIT INSTRUMENTATION LAB Cambridge, Mass.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS	
		DO NOT SCALE THIS DRAWING	DRAWN R.A. JONES DATE 13 JUN 68	INSTALLATION LIST APOLLO GUIDANCE EQUIPMENT BLOCK I	
		MATERIAL	CHECKED R.J.L. 13 JUN 68		
			APPROVAL T.A. SHOAF (4 sheets) PER TDRR W.R.		
ND 1000000			CONTRACT		
NEXT ASSY	USED ON		NASA APPROVAL	SIZE J2	CODE IDENT NO. 80230
APPLICATION		APPROVAL	MIT APPROVAL 13 JUN 68	SCALE —	SHEET 1 OF 2

1014999

1014999

		1026081 REV B	
		1026075 REV B	
		1026135 REV J	
	1026082 REV A	1026082 REV. -	
	1026081 REV A	1026081 REV. -	
	1026092 REV -	1026080 REV. -	
	1026098 REV -	1026076 REV. -	
		1026074 REV.-	
		1026066 REV.-	
	1017577	1017577	1017577
	1017576	1017576	1017576
	1021289 - 3	1021289 - 3	1021289 - 3
	1021289 - 4	1021289 - 4	1021289 - 4
	1017575	1017575	1017575
	NAS1352C04LL6	NAS1352C04LL6	NAS1352C04LL6
	1021305	1021305	1021305
	1021299	1021299	1021299
	1021303 - 011	1021303 - 011	1021303 - 011
	1015500 - 081	1015500 - 081	1015500 - 081
	1015500 - 071	1015500 - 071	1015500 - 071
	1021302 - 011	1021302 - 011	1021302 - 011
	1021304 - 031	1021304 - 031	1021304 - 031
	1021108 - 021	1021108 - 021	
	1021255 - 041	1021255 - 041	1021255 - 041
	1026071 REV C	1026071 REV. B	
	1026075 REV B	1026075 REV. A	
		1026072 REV -	
	1026069 REV A	1026069 REV -	
	1026070 REV A	1026070 REV.-	
		1026079 REV.-	
	1026073 REV A	1026073 REV. -	
	1026097 REV -		
	1026096 REV -		
	1026138 REV -		
	1026117 REV -		
	1026133 REV A	1026100 REV B	1026044 REV -
	1026119 REV -		1026046 REV -
			1026045 REV -
	1026115 REV A		1026041 REV -
	1026117 REV -		1026043 REV -
	1026116 REV A		1026042 REV -
	1026118 REV -		

CONFIGURATION DASH NO.		-121	-111	-101
G & N SYSTEMS		123	122	121
REMARKS				

ZONE	LTR	DESCRIPTION	CHG NO	DATE	APPROVED
	BW	REPLACES REV BV WITHOUT CHANGE PER TDRR SCD 4		4/28/67	
	BY	REVISED PER TDRR 33931			
	BZ	REVISION STATUS CH'G'D.			
	CA	REVISED PER TDRR 34559			
	CB	REVISED PER TDRR 35015			
	CC	REVISED PER TDRR 35644		10-18-67	

-121	-111	-101	-071	-091	-081	-051	-041	-061	-031	-021	-011	-000	QTY.	NOMENCLATURE OR DESCRIPTION	REMARKS	EQUIP CODE	FIND NO.
								1026036 REV -					1	G & N SCS ATT. CONTROL	SEE NOTE 13	55	180
								1026032 REV -					1	G & N OVERALL POLARITY TEST	SEE NOTE 13	55	179
								1026031 REV -					1	GIMBAL FRICTION TEST	SEE NOTE 13	55	178
								1026030 REV -					1	AGC ALARMS & INTERRUPTS	SEE NOTE 13	55	177
								1026029 REV -					1	E MEMORY ZERO & NIGHT WATCHMAN RESET SR	SEE NOTE 13	55	176
								1026037 REV -					1	AGC CLOCK ALIGNMENT	SEE NOTE 13	55	175
								1026039 REV -					1	K START CONTROL MISSION PROFILE	SEE NOTE 13	55	174
																	173
	1026091 REV B												1	LAUNCH LOAD	SEE NOTE 12	55	172
	1026050 REV B												1	MISSION LOAD	SEE NOTE 12	55	171
	1026089 REV J												1	FLIGHT READINESS SIMFLIGHT TEST	SEE NOTE 12	55	170
REV A	1026082 REV -												1	G/N, SCS END TO END RAMP TEST	SEE NOTE 12	55	169
REV A	1026081 REV -												1	G & N, SCS INTERFACE TEST	SEE NOTE 12	55	168
REV -	1026080 REV -												1	FLIGHT ROPE CONTROLLED MISSION PROFILE	SEE NOTE 12	55	167
REV -	1026076 REV -												1	FLIGHT ROPE CONTROLLED MISSION PROFILE	SEE NOTE 12	55	166
	1026074 REV -												1	AGC ALARMS & INTERRUPTS	SEE NOTE 12	55	165
	1026066 REV -												1	G & N SCS COUNTDOWN TESTS	SEE NOTE 12	55	164
																	163
	1017577	1017577			1017577		1017577						1	RETAINER, SCREW (BOT)		40	162
	1017576	1017576			1017576		1017576						1	RETAINER, SCREW (TOP)		40	161
3	1021289 - 3	1021289 - 3			1021289 - 3		1021289 - 3						6	SCREW, CAP SOC HD CAPTIVE		40	160
4	1021289 - 4	1021289 - 4			1021289 - 4		1021289 - 4						5	SCREW, CAP SOC HD CAPTIVE		40	159
	1017575	1017575			1017575		1017575						7	SCREW, CAP SOC HD, SPECIAL		40	158
C04LL6	NAS1352C04LL6	NAS1352C04LL6			NAS1352C04LL6		NAS1352C04LL6						30	SCREW, CAP SOC HD		40	157
101	1021305	1021305			1021305		1021305						10	SEAL, CONNECTOR		40	156
	1021299	1021299			1021299		1021299						1	PANEL (INSEP ASSY)		40	155
011	1021303 - 011	1021303 - 011			1021303 - 011		1021303-011						1	FRAME MACHINING ASSY		40	154
081	1015500 -081	1015500 -081			1015500 - 051								2	CDU ASSEMBLY		40	153
071	1015500 -071	1015500 -071			1015500 - 041		1015500 - 071 (5)						3	CDU ASSEMBLY		40	152
011	1021302 - 011	1021302 - 011			1021302 - 011		1021302 - 011						1	C/SE AND PANEL ASSY, CDU	SEE NOTE 4	40	151
031	1021304 - 031	1021304 - 031			1021304 - 011		1021304 - 041						1	COUPLING DISPLAY ASSEMBLY	SEE NOTE 4	40	150
021	1021106 - 021					1021106 - 021							1	COMPUTER PROGRAM ASSEMBLY	SEE NOTE 11	55	149
041	1021255 - 041	1021255 - 041		1021255-021	1021255 - 021		1021255-051	1021255-031					1	ANN PANEL AND EYEPIECE STOWAGE ASSY		62	148
																	147
REV C	1026071 REV B						1026064 REV -						1	G & N, SCS INTERFACE TEST	SEE NOTE 12	55	146
REV B	1026075 REV A					1026034 REV C	1026056 REV A						1	FLIGHT ROPE CONTROLLED MISSION	SEE NOTE 12	55	145
						1026014 REV -	1026055 REV A						1	G & N ALARMS AND INTERRUPTS TEST	SEE NOTE 12	55	144
						1026015 REV B	1026053 REV -						1	G & N ATTITUDE CONTROL INTERFACE TEST	SEE NOTE 12	55	143
	1026072 REV -					1026012 REV B	1026052 REV -						1	AGC ERASABLE MEMORY ZEROING TAPE	SEE NOTE 12	55	142
						1026011 REV A	1026054 REV -						1	G & N POLARITY TEST	SEE NOTE 12	55	141
REV A	1026069 REV -					1026024 REV -	1026049 REV -						1	GIMBAL FRICTION TEST	SEE NOTE 12	55	140
						1026022 REV -	1026050 REV -						1	GYRO COMPASSING DATA LOAD	SEE NOTE 12	55	139
						1026021 REV -							1	K START CONTROL MISSION PROFILE	SEE NOTE 12	55	138
REV A	1026070 REV -					1026035 REV -	1026057 REV B						1	G & N TO BC POLARITY TEST	SEE NOTE 12	55	137
						1026047 REV -							1	ACE-G&N 132 OPT OE-MEMORY	SEE NOTE 12	55	136
	1026079 REV -					1026048 REV C	1026065 REV -						1	K START ASSY CONTROLLED MISSION PROFILE FLIGHT ROPE	SEE NOTE 12	55	135
REV A	1026073 REV -					1026051 REV -	1026061 REV A						1	TVC GIMBAL POSITION TEST	SEE NOTE 12	55	134
							1026058 REV -						1	GIMBAL POSITION TEST	SEE NOTE 12	55	133
REV -							1026059 REV -						1	GIMBAL FRICTION TEST A REL 204	SEE NOTE 12	55	132
REV							1026062 REV A						1	AGC ALARM & INTERRUPT A REL 204	SEE NOTE 12	55	131
							1026063 REV -						1	AGC E-MEM ZEROING TAPE A REL 204	SEE NOTE 12	55	130
REV -							1026060 REV B										129
REV -													1	PIPA SCALE FACTOR TEST	SEE NOTE 10	55	128
REV -													1	AGC ALARM & INTERRUPT TEST	SEE NOTE 10	55	127
REV A	1026100 REV B	1026044 REV -				1026100 REV A	1026040 REV -						1	K START CONTROL SIMULATED FLIGHT	SEE NOTE 10	55	126
REV -		1026046 REV -					1026020 REV -						1	GIMBAL FRICTION TEST	SEE NOTE 10	55	125
								1026019 REV -					1	K START CONTROL MISSION PROFILE	SEE NOTE 10	55	124
						1026013 REV C							1	GYRO INTEG AND MISSION PROFILE	SEE NOTE 10	55	123
		1026045 REV -				1026016 REV -	1026018 REV -	1026017 REV -					1	NIGHT WATCHMAN ALARM RESET TAPE	SEE NOTE 10	55	122
						1026009 REV -	1026036 REV -	1026010 REV -					1	AGC CLOCK ALIGNMENT TEST	SEE NOTE 10	55	121
REV A		1026041 REV -				1026004 REV -	1026028 REV -	1026005 REV -					1	G & N SCS ATT. CONTROL INTERFACE TEST	SEE NOTE 10	55	120
REV -		1026043 REV -				1026003 REV -	1026026 REV -	1026008 REV -					1	G & N ALARMS & INTERRUPTS TEST	SEE NOTE 10	55	119
REV A		1026042 REV -				1026002 REV -	1026027 REV A	1026007 REV -					1	G & N POLARITY TEST	SEE NOTE 10	55	118
B REV -						1026001 REV -		1026006 REV -					1	AGC ERASABLE MEM. ZEROING & SELF CHECK	SEE NOTE 10	55	117
								1008268					1	WIRE HARNESS "B"	SEE NOTE 9		116
						2018898							1	WIRING HARNESS			115
						1001496 -76							2	SCREW, BUTTON HD. SPLINE SOCKET			114
						1010705 - 8							1	CLAMP LOOP			113
						1010705 - 6							1	CLAMP LOOP			112
						1010705 - 5							1	CLAMP LOOP			111
						1010705 - 4							1	CLAMP LOOP			110
123	122	121	109	111	110	17	12	20	8	7	6	5					

SEE NOTE 15

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON	MIT INSTRUMENTATION LAB CAMBRIDGE MASS.	MANNED SPACECRAFT CENTER HOUSTON, TEXAS
2 PLACE 3 PLACE DECIMALS DECIMALS ANGLES + + + — — —	DRAWN R.A. JONES DATE 6/1/67 CHECKED A.L.L. DATE 6/1/67 APPROVAL O. MORG PERTDRR #4 CONTRACT	INSTALLATION LIST APOLLO GUIDANCE EQUIPMENT BLOCK I
DO NOT SCALE THE DRAWING	MATERIAL — NASA APPROVAL	SIZE J2 CODE IDENT NO. 80230 1014999
NEXT ASSY — USED ON — APPLICATION	APPROVAL MIT APPROVAL W. KLEIPER 5/31/67	SCALE — SHEET 2 OF 2

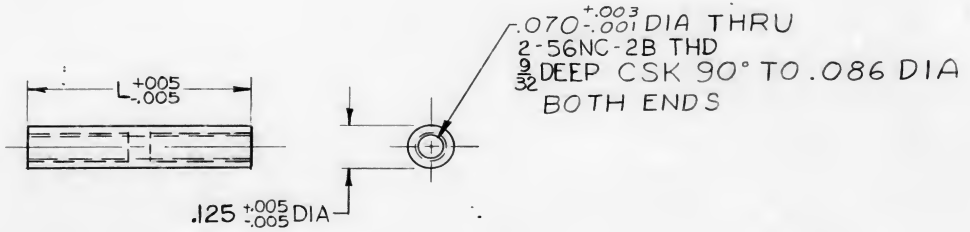
1014999 REV

1014999 REV

1014999 REV

C 1015135

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVAL
A	REVISED PER TDRR 01194 UPGRADED TO CLASS A	8 MAY 63	WR
B	REVISED PER TDRR 04492	5 Nov 63	RDK WR
C	REVISED PER TDRR 11354	12 AUG 64	JVP



NASA PART NO	LENGTH "L"
1015135-001	.500
-002	.531
-003	.562
-004	.594
-005	.625
-006	.656
-007	.688
-008	.719
-009	.750
-010	.781
-011	.812
-012	.844
-013	.875
-014	.906
-015	.938
-016	.969
-017	1.000
-018	1.031

NASA PART NO	LENGTH "L"
1015135-019	1.062
-020	1.093
-021	1.156
-022	1.125
-023	1.170

NOTES:
FINISH ALL OVER 125 √ AA
MATERIAL SPECIFICATION
NYLON MIL-P-17091
TYPE I
INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
UNLESS OTHERWISE SPECIFIED
REMOVE SHARP EDGES

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
LIST OF MATERIALS			

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL SEE NOTE
HEAT TREATMENT —
FINAL FINISH —

MIT INSTRUMENTATION LAB, CAMBRIDGE, MASS
DWG. NO. CONTRACT

DRAWN LEWANDOWSKI DATE 3-26-63
CHECKED R. L. Battaglia
APPROVAL R. L. Battaglia
APPROVAL
NASA APPROVAL W. J. Rhine 3-27-63
MIT APPROVAL W. Hughes 27 Mar 63

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

SPACER
NYLON

CODE IDENT NO. | SIZE C | NASA DRAWING NO. 1015135
SCALE 4X | WT | SHEET 1 OF 1

1015135

			ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040									BENCH MAINTENANCE GSE CMRM		51
			ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039									AUXILIARY GROUND SUPPORT EQUIPMENT MANUAL		50
			ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038									PACKING, SHIPPING, & HANDLING MANUAL		49
									ND1021034	ND1021034	ND1021034	ND1021034	ND1021034	ND1021034	ND1021034		ASSOCIATED TEST EQUIPMENT CMRM		48
			ND1002324	ND1002324	ND1002324												ND POST INSTALLATION C/O SPEC. FOR G&N SYSTEM ~~60-14~~		47
			ND1002320														ND ACE-S/C DISPLAY & CONTROL FOR S/C 20 AT [illegible]C		46
		~~1003581~~	1009581	1009581	1009581	1009581	1009581	1009581	1010075			1010075	1010075	1010075	1010075		APOLLO G & N STRUCTURE GROUNDS DIAGRAM		45
		~~1009573~~	1009573	1009573	1009573	1009573	1009573	1009573	1010076		1010076	1010076	1010076	1010076	1010076		APOLLO OPTICAL SUBSYSTEM 0V DC POWER DISTRIBUTION DIAGRAM		44
		~~1009572~~	1009572	1009572	1009572	1009572	1009572	1009572	1010077			1010077	1010077	1010077	1010077		APOLLO OPTICAL SUBSYSTEM +28 VDC POWER DISTRIBUTION DIAGRAM		43
									1010078			1010078	1010078	1010078	1010078		APOLLO OPTICAL SUBSYSTEM 256 KC/S POWER DISTRIBUTION DIAGRAM		42
		~~1009574~~	1009574	1009574	1009574	1009574	1009574	1009574	1010079			1010079	1010079	1010079	1010079		APOLLO OPTICAL SUBSYSTEM 28V 1% 28V 5% 800CPS POWER DIST. DIAGRAM		41
		~~1009577~~	1009577	1009577	1009577	1009577	1009577	1009577	1010080			1010080	1010080	1010080	1010080		APOLLO INERTIAL SUBSYSTEM 0V DC POWER DISTRIBUTION DIAGRAM		40
		~~1009582~~	1009582	1009582	1009582	1009582	1009582	1009582	1010081			1010081	1010081	1010081	1010081		APOLLO G & N 400 CPS POWER DISTRIBUTION DIAGRAM		39
		~~1009576~~	1009576	1009576	1009576	1009576	1009576	1009576	1010082			1010082	1010082	1010082	1010082		APOLLO INERTIAL SUBSYSTEM +28 VDC POWER DISTRIBUTION DIAGRAM		38
									1010083			1010083	1010083	1010083	1010083		APOLLO INERTIAL SUBSYSTEM 3200 CPS, 256 KC POWER DISTRIBUTION DIAGRAM		37
		~~1009579~~	1009579	1009579	1009579	1009579	1009579	1009579	1010084			1010084	1010084	1010084	1010084		APOLLO INERTIAL SUBSYSTEM -28, +2, -32, +120 VDC POWER DISTRIBUTION DIAGRAM		36
		~~1009578~~	1009578	1009578	1009578	1009578	1009578	1009578	1010085			1010085	1010085	1010085	1010085		APOLLO INERTIAL SUBSYSTEM 28V 1%, 28V 5% 800 CPS POWER DIST DIAGRAM		35
		~~1009515~~	1009515	1009515	1009515	1009515	1009515	1009515	1010137	1010194	1010194	1010137	1010137	1010137	1010137		TRUNNION MANUAL MODE DIAGRAM		34
		~~1009575~~	1009575	1009575	1009575	1009575	1009575	1009575	1015560			1015560	1015560	1015560	1015560		APOLLO INERTIAL SUBSYSTEM ONE WIRE MECHANIZATION DRAWING		33
		~~1009549~~	1009549	1009549	1009549	1009549	1009549	1009549	1015561			1015561	1015561	1015561	1015561		TWO WIRE MECHANIZATION DRAWING OF PIPA LOOPS		32
		~~1009550~~	1009550	1009550	1009550	1009550	1009550	1009550	1015562			1015562	1015562	1015562	1015562		TWO WIRE MECHANIZATION DRAWING OF STABILIZATION LOOPS		31
		~~1009516~~	1009516	1009516	1009516	1009516	1009516	1009516	1010135	1010192	1010192	1010135	1010135	1010135	1010135		SEXTANT OPTICS RESOLVED MODE WIRING DIAGRAM		30
		~~1009513~~	1009513	1009513	1009513	1009513	1009513	1009513	1010136	1010193	1010193	1010136	1010136	1010136	1010136		ZERO OPTICS MODE WIRING DIAGRAM		29
		~~1009512~~	1009512	1009512	1009512	1009512	1009512	1009512									TWO WIRE MECH OPTICS		28
									ND1021001	ND1021001	ND1021001	ND1021001	ND1021001	ND1021001	ND1021001		APOLLO GUIDANCE COMPUTER SUBSYSTEM CMRM	NOTE 2	27
																ND1002218	APOLLO G & N SYSTEM POST INSTALLATION CHECKOUT		26
		~~1026000~~	1026000	1026000	1026000	1026000	1026000	1026000	1015000	1025500	1025500	1015000	1015000	1015000	1015000		FTM FOR APOLLO G & N SYSTEM		25
		~~1015497~~	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497		ATP FOR APOLLO G & N. INERTIAL SUBSYSTEM		24
		~~1009502~~	1009502	1009502	1009502	1009502	1009502	1009502	1015100	1010191	1010191	1015100	1015100	1015100	1015100		ATP FOR APOLLO G & N OPTICS SUBSYSTEM		23
		~~1026000~~	1026000	1026000	1026000	1026000	1026000	1026000	1015000	1025500	1025500	1015000	1015000	1015000	1015000		ATP PRE-INSTALLATION FOR APOLLO G & N SYSTEM		22
		~~1015497~~	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497	1015497		ISS ASSEMBLY CONFIGURATION		21
																ND 1021037	GUIDANCE AND NAVIGATION SYSTEM EQUIP. FAMILIARIZATION MANUAL		20
		~~1021041~~	1021041	1021041	1021041	1021041	1021041	1021041	ND1021036	ND1021036	ND1021036	ND1021036	ND1021036	ND1021036	ND1021036		GUIDANCE AND NAVIGATION SYSTEM, CMRM		19
									ND1021067	ND1021067	ND1021067	ND1021067	ND1021067	ND1021067	ND1021067		OPTICAL UNIT SYSTEM, CMRM	NOTE 2	18
									ND1021035	ND1021035	ND1021035	ND1021035	ND1021035	ND1021035	ND1021035		OPTICS INERTIAL TEST SET CMRM		17
												ND1021069	ND1021069	ND1021069	ND1021069		MAP AND DATA VIEWER, CMRM		16
																			15
																			14
		~~1009518~~	1009518	1009518	1009518	1009518	1009518	1009518									TRACKER MODE		13
		~~1009517~~	1009517	1009517	1009517	1009517	1009517	1009517	1010139	1010196	1010196	1010139	1010139	1010139	1010139		OPTICAL SUBSYSTEM POWER DISTRIBUTION DIAGRAM		12
		~~1009548~~	1009548	1009548	1009548	1009548	1009548	1009548								1010038	IMU/CDU FUNCTIONAL DIAGRAM		11
									1000299			1000299	1000299	1000299	1000299		TRIPLE SPEED RESOLVER CHAIN PHASING AND NORMALIZING DIAGRAM		10
		~~1009547~~	1009547	1009547	1009547	1009547	1009547	1009547	1010037			1010037	1010037	1010037	1010037		IMU/CDU MODING MECHANIZATION DIAGRAM		9
																1014616	INSTALLATION LAYOUT OF G & N INTERCONNECT HARNESS TO S/C		8
																			7
		~~1009580~~	1009580	1009580	1009580	1009580	1009580	1009580	1017510			1017510	1017510	1017510	1017510		IMU TEMPERATURE CONTROL SYSTEM 2 WIRE MECH. DRAWING		6
																			5
									1010039			1010039	1010039	1010039	1010039		IMU TEMPERATURE CONTROL SYSTEM SCHEMATIC		4
		~~1009514~~	1009514	1009514	1009514	1009514	1009514	1009514	1010138	1010195	1010195	1010138	1010138	1010138	1010138		SHAFT MANUAL MODE SCHEMATIC		3
																			2
		~~1009502~~	1009502	1009502	1009502	1009502	1009502	1009502	1015100	1010191	1010191	1015100	1015100	1015100	1015100		FUNCTIONAL DIAGRAM OPTICS SUBSYSTEM		1
		~~131~~	-121	-111	-101	-091	-081	-071	-061	-051	-041	-031	-021	-011	-000	EFFECTIVITY UNDEFINED	TITLE	REMARKS	FIND NO.
		~~124~~	123	122	121	111	110	109	20	17	12	8	7	6	5	G & N EFFECTIVITY			

NOTES:

1. THIS DRAWING FOR REFERENCE ONLY
2. OPTICAL UNIT SYSTEM & AGC SUB-SYSTEM INFORMATION CONTAINED IN 1021041 FOR 100 SERIES.
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-7027.

REVISIONS

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
		4244				
(A)						
A		REVISED PER TDRR 15158			1-16-68	[illegible]
B		REVISED PER TDRR 20911			3-26-68	[illegible]
C		REVISED PER TDRR 22254			5-6-68	[illegible]
D		REVISED PER TDRR 23622			7-2-68	[illegible]
E		REVISED PER TDRR 24259	RAJ		10-25-68	[illegible]
(B) F		REVISED PER TDRR 24992	RAJ		12-26-68	[illegible]
(A) G		REVISED PER TDRR 30651	JAB	CP	7-9-69	[illegible]
H		REVISED PER TDRR 32003	MED	[illegible]	9-29-69	[illegible]
J		REVISED PER TDRR 33186	WRB	CP	12-16-69	[illegible]
K		REVISED PER TDRR 3.285	LW	[illegible]	3-26-70	[illegible]
L		REVISED PER TDRR 33933	RAB	[illegible]	11-19-70	[illegible]

QTY REQD	PART OR IDENTIFYING NO	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
			LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. CAPACITOR VALUES ARE IN μf. RESISTOR VALUES ARE IN OHMS. TOLERANCES ON FRACTIONS ±, DECIMALS ±, ANGLES ±. DO NOT SCALE THIS DRAWING.

MATERIAL

ND 1000000 — NEXT ASSY — USED ON — APPLICATION

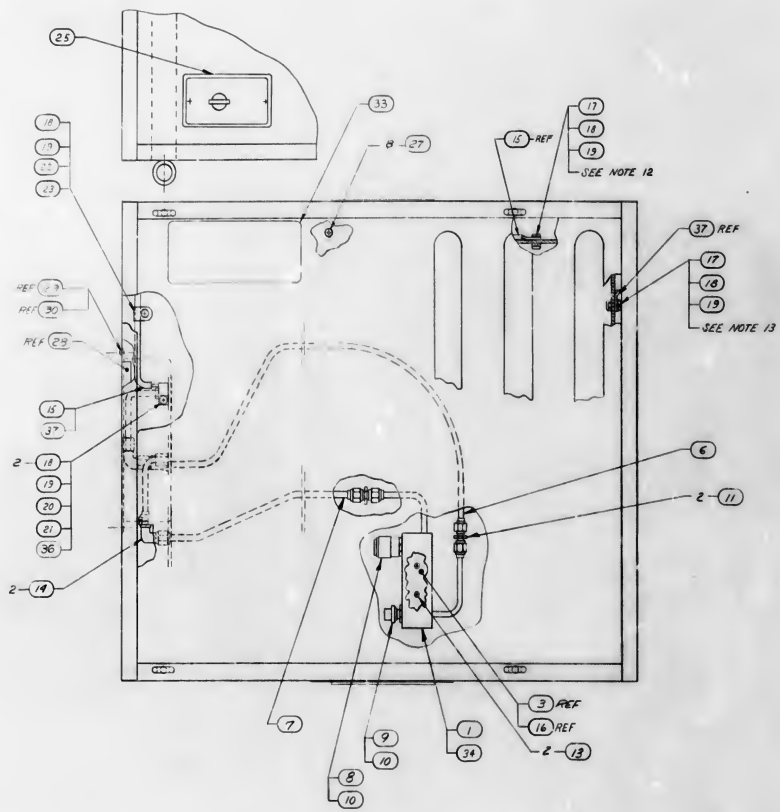
MIT INSTRUMENTATION LAB CAMBRIDGE, MASS.

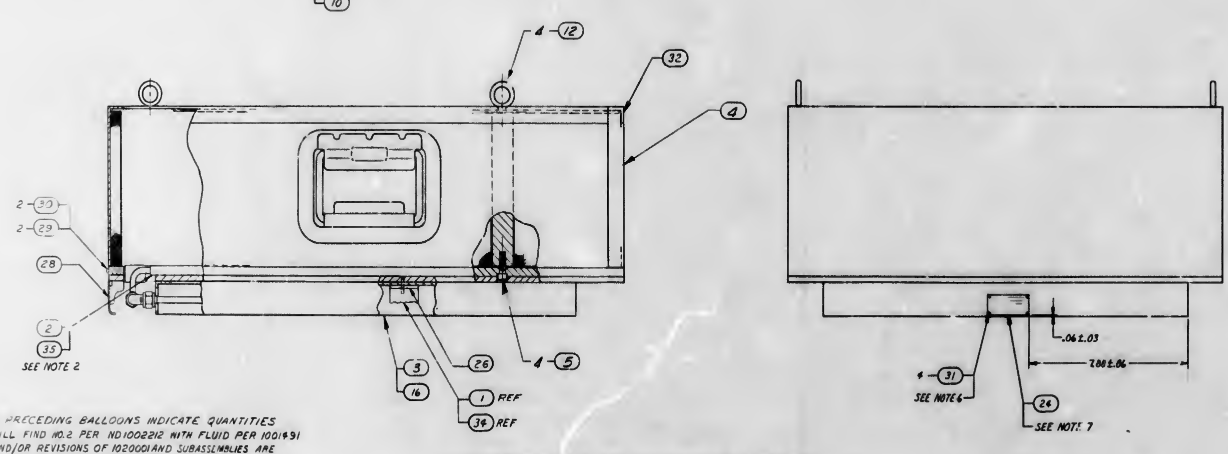
MANNED SPACECRAFT CENTER HOUSTON, TEXAS

DRAWN [illegible] 11-13-68
CHECKED [illegible] 11-13-68
APPROVED [illegible]
APPROVED [illegible]
APPROVED MIT [illegible]
APPROVED MSC [illegible]
DATE

G & N COMMAND MODULE SUPPORTING DOCUMENT LIST BLOCK I

CODE IDENT NO 80230 — SIZE E — DRAWING NO. 1010999 — SCALE — SHEET 1 OF 1





1	2	3
F	F	F
E	E	
D	D	
C		
B		
A		

REVISION STATUS OF ASSY

SYM	DESCRIPTION	DATE	APPROVED
—	CL B RELEASED PER TDRR NO.04[illegible]		
A	CHANGED PER TDRR 06768 DR J.S. [illegible] CHK [illegible] APPD [illegible]	[illegible] MAR 64	[illegible]
B	CHANGED PER TDRR 08125 DR. [illegible] CHK [illegible] APPD [illegible]	[illegible] MAY 64	[illegible]
C	CHANGED PER TDRR 09779 DR [illegible] CHK [illegible] APPD [illegible]	[illegible] 64	[illegible]
D	CHANGED PER TDRR 12926 DR J.P [illegible] CHK [illegible] APPD [illegible]	14 OCT 64	[illegible]
E	UPGRADE TO CLASS A WITH CHANGE PER TDRR 14860 DR. [illegible] CHK [illegible] APPD [illegible]	[illegible] JAN 65	[illegible]
F	CHANGED PER TDRR 16703 DR [illegible] CHK [illegible] APPD [illegible]	[illegible] 65	[illegible]
G	CHANGED PER TDRR 25577 DR [illegible] CHK [illegible] APPD [illegible]	[illegible]	[illegible]

	QTY REQD -4	QTY REQD -3	QTY REQD -2	QTY REQD -1	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO
NOT SHOWN SEE NOTE 14	12	-	-	-	2016351	SCREW, CAP, SOCKET HEAD	38
	1	1	-	-	1020276-011	GROUND STRAP ASSY	37
NOT SHOWN	X	X	X	X	1020339	MOUNTING KIT, BLOCK [illegible]	REF
NOT SHOWN	—	X	X	—	1020338	MOUNTING KIT, BLOCK I[illegible]	REF
	1	1	1	-	MS35335-60	WASHER, LOCK FLAT-[illegible]	36
SEE NOTE 9	X	X	X	—	1020224	INSTALLATION OF AGC TO HAND FIX	REF
SEE NOTE 8	X	X	X	X	1020107	INSTALLATION OF AGC TO HAND FIX	REF
SEE NOTE 4	1	1	1	-	1021521	COLD PLATE ASSY	35
	1	1	1	-	1020233	MANIFOLD & TUBE ASSY	34
	1	1	1	1	1006241	PLUG, PROTECTIVE PLASTIC	33
	1	1	1	1	1006240	CAP, PROTECTIVE PLASTIC	32
	4	4	4	4	MS20470A2-4	RIVET, SOLID UNIVERSAL HEAD	31
	2	2	2	2	MS15795-807	WASHER, FLAT	30
	2	2	2	2	MS35233-42	SCREW, PAN HD	29
	1	1	1	1	1020196	COVER, TUBING	28
	8	8	8	8	MS35216-55	SCREW, MACH, PAN HD CROSS RECESSED	27
	—	—	1	1	1020197	PLATE, SPACER	26
SEE NOTE 3	X	X	X	X	1014398	INTERFACE CONTROL DOC.	REF
	1	1	1	1	1020108	PLATE, ACCESS	25
	1	1	1	1	1020085	PLATE, IDENTIFICATION	24
	1	1	1	-	MS35234-65	SCREW, MACH PAN HD	23
	1	1	1	-	MS21919-DG2	STRAP, RETAINING	22
	1	1	1	-	MS35234-64	SCREW, MACH PAN HD	21
	1	1	1	-	SEE NOTE 10	CLAMP, LOOP	20
	3	3	3	-	MS21044C3	NUT, SELF-LOCKING	19
	4	4	4	-	MS15795-808	WASHER, PLAIN	18
	1	1	1	-	MS35234-64	SCREW, MACH PAN HD	17
	1	1	1	-	1020297	PLATFORM ASSY HAND. FIXTURE	16
	—	—	1	-	1020276-000	GROUND STRAP ASSY	15
	2	2	2	2	AN821-4D	ELBOW	[illegible]
	2	2	2	2	MS35200-72	SCREW, MACH FLAT CSK HD	13
	4	4	4	4	1006674-1	SCREW, EYE	12
	2	2	2	2	AN815-4D	UNION	11
	2	2	2	2	MS28778-4	PACKING, PREFORMED	10
	1	1	1	1	1000135	COUPLING-HALF, MALE	9
	1	1	1	1	1006659-1	COUPLING-HALF, FEMALE	8
	1	1	1	1	1020067-1	HOSE, HYDRAULIC	7
	1	1	1	1	1020067-2	HOSE, HYDRAULIC	6
	4	4	4	4	MS16995-65	SCREW, CAP SOC HD	5
	1	1	1	1	1014399	COVER, THERM INSULATOR	4
	—	—	—	1	1014392	PLATFORM ASSY HANDLING FIXTURE	3
SEE NOTE 4	—	—	—	1	1015422	COLD PLATE ASSY	2
	—	—	—	1	1014493	MANIFOLD & TUBE ASSY	1

LIST OF MATERIALS

NOTES

1. NUMBERS PRECEDING BALLOONS INDICATE QUANTITIES
2. PURGE & FILL FIND NO.2 PER ND1002212 WITH FLUID PER 1001491
3. CHANGES AND/OR REVISIONS OF 1020001 AND SUBASSEMBLIES ARE SUBJECT TO THE DIMENSIONS AND FEATURES DEFINED IN 1014398
4. FIND NUMBERS 2 & 35 ARE GOVERNMENT FURNISHED MATERIAL
5. CHANGES TO THIS DWG MUST BE REFLECTED ON ICD DWG NO 1014398
6. USING FIND NO. 24 AS A TEMPLATE DRILL 4 HOLES $^{.067}_{.070}$ DIA
7. STAMP .06 HIGH GOTHIC CHARACTERS PER ND1002019 & ND1002023
8. INSTALLATION OF BLOCK I AGC.
9. INSTALLATION OF BLOCK IF (10- SERIES) AGC.
10. SELECT FIND NO 20 FROM MS9353-03 THRU 05. CORRECT SIZE TO BE DETERMINED BY TUBING OD.
11. ORIGINAL CONFIGURATION IS IDENTIFIED BY THE DWG NO. & A-1 SUFFIX.
12. ASSEMBLE FIND NO. 15, FIND NO.17, FIND NO. 18 & FIND NO.19 AS SHOWN FOR 1020001-2
13. ASSEMBLE FIND NO. 37, FIND NO.17, FIND NO.18 & FIND NO.19 AS SHOWN FOR 1020001-3 & 1020001-4
14. FIND 38 SHALL BE SUPPLIED AND IDENTIFIED PER ND1002019

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1900030	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

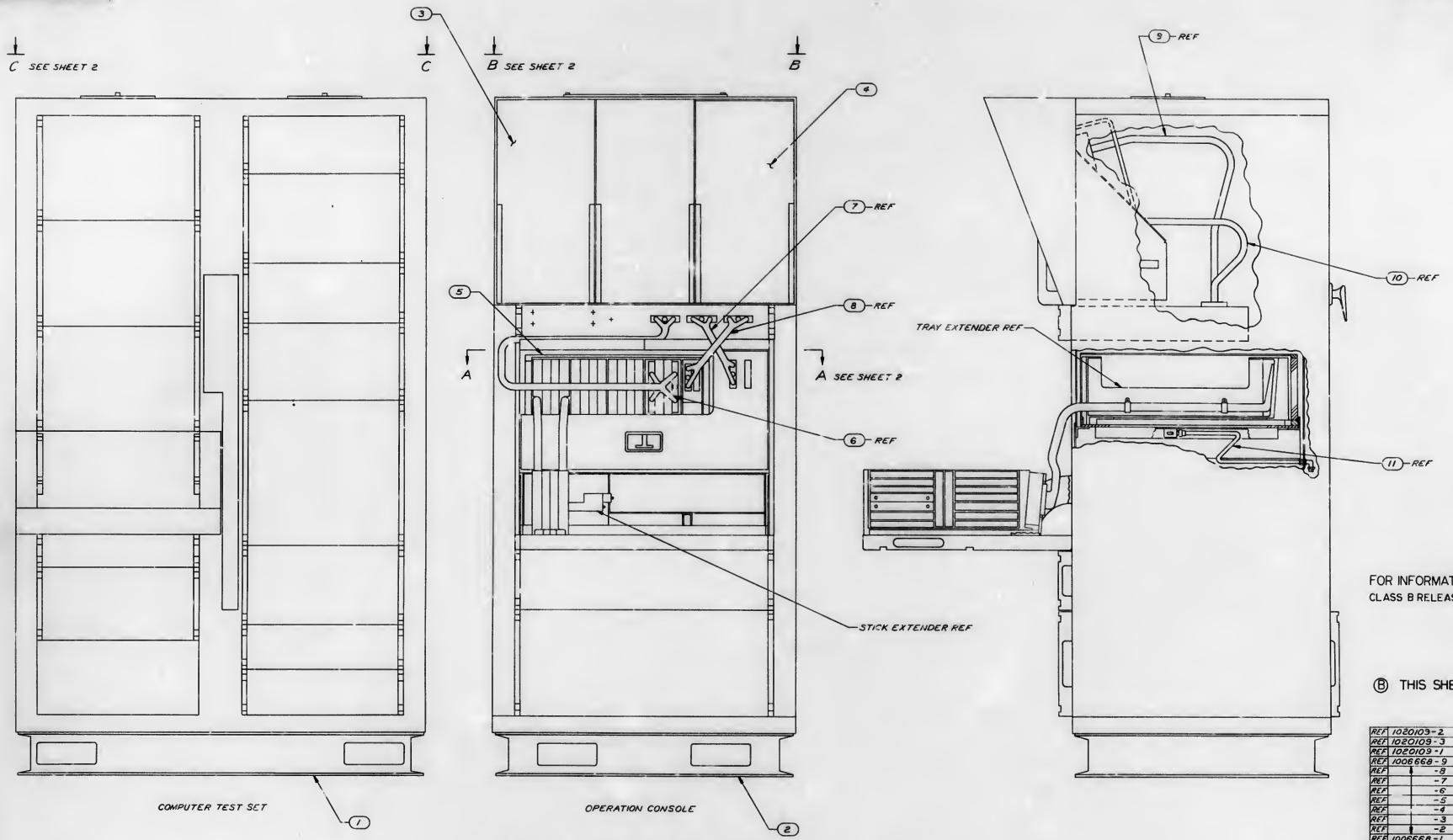
RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN [illegible] DATE [illegible]
CHECKED [illegible] 4 OCT 6[illegible]
APPROVAL [illegible]
APPROVAL [illegible]
APPROVAL [illegible]
NASA APPROVAL [illegible]
MIT APPROVAL [illegible]
MIT APPROVAL [illegible]

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

HANDLING FIXTURE, AGC

CODE IDENT NO	SIZE	NASA DRAWING NO
49956	J	1020001
SCALE 1/2	WT	SHEET 1 OF 1

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	THIS SHEET ADDED PER TDRR 06040	2/12/64	



FOR INFORMATION ONLY

FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. 06040 DATE 2/12/64

(B) THIS SHEET ADDED

B	B
—	A
SHEET 1	SHEET 2
REV STATUS OF SHEETS	

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIG NO
REF	1020103-2	CABLE ASSY W32	23
REF	1020109-3	W31	24
REF	1020109-1	W30	23
REF	1006668-9	W29	22
REF	-8	W28	21
REF	-7	W27	20
REF	-6	W26	19
REF	-5	W25	18
REF	-4	W24	17
REF	-3	W23	16
REF	-2	W22	15
REF	1006668-1	CABLE ASSY W21	14
REF	1020093	TEST MOUNT CABLE B	13
REF	1020092	TEST MOUNT CABLE A	12
REF	AN6270-8-91	HOSE ASSY	11
REF	1020095	NAV DSKY TO JUNCTION BOX	10
REF	1020094	MAIN DSKY TO JUNCTION BOX	9
REF	1020097	TEST CABLE C	8
REF	1020096	TEST CABLE B	7
REF	1020102	TEST CABLE A	6
1	1020107	AGC CMPTR TO HANDLING FIX ASSY	5
1	1020105	NAV DSKY TO HANDLING FIX ASSY	4
1	1020106	MAIN DSKY TO HANDLING FIX ASSY	3
1	1014465	OPERATION CONSOLE	2
1	1014156	COMPUTER TEST SET	1

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
FINAL
NEXT ASSY | USED ON
APPLICATION

RAYTHEON CO. LEXINGTON, MASS.
SUBMITTED BY RAS 9-491
DRAWN RCF DATE 2/12/64
CHECKED
APPROVED
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

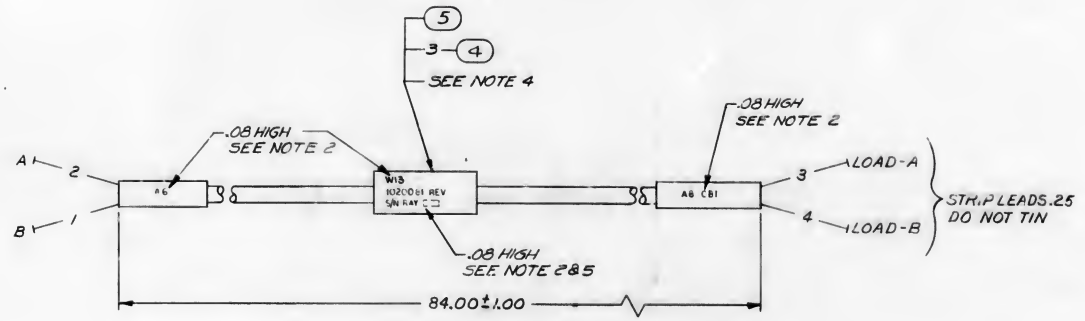
AGC/GSE INTERCONNECTIONS
(AGC SYSTEM TEST)

CODE IDENT NO — SIZE J — NASA DRAWING NO 1020002
SCALE 1/8 WT SHEET 1 OF 2

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
(1) –	CL B RELEASE PER TDRR		
A	CLASS II CHANGE PER RD R5670 DR ST. CHK W. APPD	8 JAN 64	
B	CHANGED PER TDRR 10104 DR K. CHK & G.C. APPD	28 JUNE 64	
C	UPDATE TO CLASS A WITH CHANGES PER TDRR 18766 DR CHK APPD	15 MAY 65	

ASSEMBLY INFORMATION CHART						
FROM		DESCRIPTION			TO	
REMARKS	RUN NO.	COLOR	AWG	FIND NO.	RUN NO.	REMARKS
	2	BLK	18	1	3	ATTACH FIND NO. 2
	1	WHT			4	



NOTES:
1. FOR FABRICATION SEE ND1002032
2. MARK GOTHIC CHARACTERS AS SHOWN PER ND1002019 USING BLACK INK 1006256-001
3. STRIP LEADS .19
4. BOND FIND NO. 4 USING FIND NO. 5
5. SERIALIZE PER ND1002023

QTY REQD	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO
AR	1006253	ADHESIVE	5
3	1014472-1A	BAND MARKER, CABLE	4
~~1~~	~~1014472-1~~	~~BAND MARKER, CABLE~~	~~3~~
2	1006960-3	LUG TERMINAL	2
AR	1006966-3	CABLE ELECTRICAL	1

LIST OF MATERIALS

1020344	
1014217	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
HEAT TREATMENT
FINAL FINISH

RAYTHEON CO.
LEXINGTON, MASS.
CONTRACT NO. NAS9-498

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN DATE 21 OCT 63
CHECKED 21 OCT 63
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

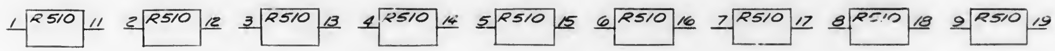
CABLE ASSEMBLY
W13
AGC CALIBRATION CONSOLE

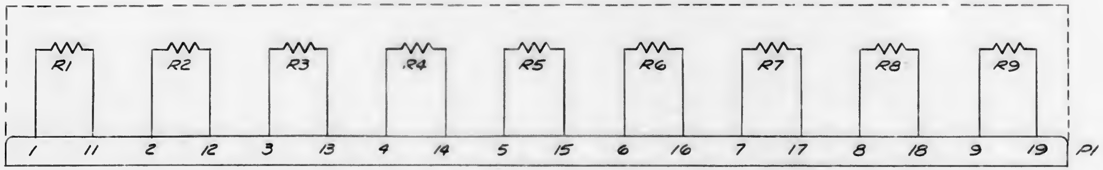
CODE IDENT NO. —— SIZE D NASA DRAWING NO. 1020081
SCALE 1/1 WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

1020081 C

SYM	DESCRIPTION	DATE	APPROVED
—	CLASS B RELEASE PER TDRR 06454	2/10/64	





FOR INFORMATION ONLY
CLASS B RELEASE PER TDRR NO 06454 DATE 2/10/64

REF DES	PART NO.	DESCRIPTION	VALUE	TOL	RATING
R1	1006760-25	RESISTOR	510Ω	±2%	1/2W
R2	1006760-25	RESISTOR	510Ω	±2%	1/2W
R3	1006760-25	RESISTOR	510Ω	±2%	1/2W
R4	1006760-25	RESISTOR	510Ω	±2%	1/2W
R5	1006760-25	RESISTOR	510Ω	±2%	1/2W
R6	1006760-25	RESISTOR	510Ω	±2%	1/2W
R7	1006760-25	RESISTOR	510Ω	±2%	1/2W
R8	1006760-25	RESISTOR	510Ω	±2%	1/2W
R9	1006760-25	RESISTOR	510Ω	±2%	1/2W
P1	1014038	CONN			

NOTES
1. PARTIAL REFERENCE DESIGNATIONS ARE SHOWN
PREFIX EACH REFERENCE DESIGNATION WITH
UNIT NUMBER OR ASSEMBLY DESIGNATION OR BOTH

REF DRAWING
1. MECHANICAL ASSY 1014065-3

QTY REQD	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
1014065-3	

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

RAYTHEON CO. LEXINGTON, MASS
CONTRACT NO NAS 9-498
DRAWN — DATE 25 Jan 64
CHECKED — 25 Jan 64
APPROVAL
APPROVAL
APPROVAL
NASA APPROVAL
MIT APPROVAL
MIT APPROVAL

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

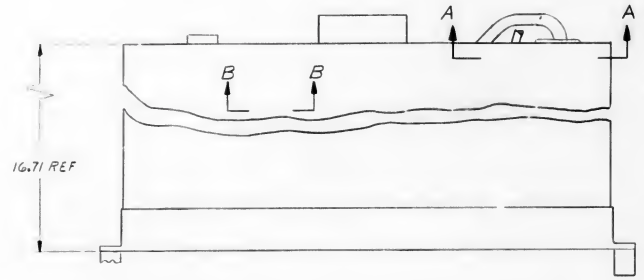
RESISTOR MODULE (510)
ELECTRICAL SCHEMATIC DIAGRAM

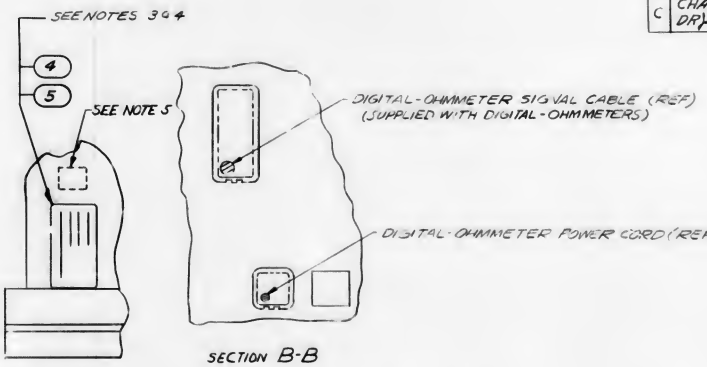
CODE IDENT NO — SIZE D NASA DRAWING NO 1020130
SCALE NONE WT SHEET 1 OF 1

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

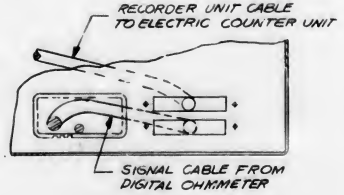
1020130

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
--	CLASS A RELEASED PER TDRR NO 15713	1/14/65	
A	CHANGED PER TDRR 23118 DR D. Bolanger CHK C.B. APPD	2/2/65	
B	CHANGE PER TDRR 23976 DR L. Jones CHK C.B. APPD	3/5/65	
C	CHANGED PER TDRR 24222 DR CHK C.B. APPD	3/29/65	

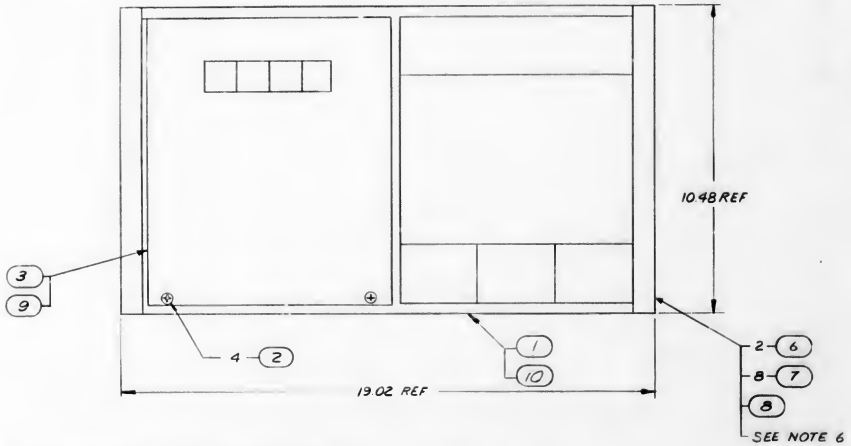




SECTION B-B



SECTION A-A



NOTES
1. HARDWARE TO BE SUPPLIED WITH FIND NO. 1
2. NUMBERS PRECEDING FIND NUMBERS INDICATE QUANTITIES
3. ASSEMBLE FIND NO. 4 USING FIND NO. 5 WHERE SHOWN
4. STAMP .06 HIGH GOTHIC CHARACTERS PER ND1002019 & ND1002023
5. MARK APPROX WEIGHT IN LBS PER ND1002123, .25 HIGH GOTHIC CHARACTERS PER ND1002019, USING MARKING INK 1006271-10 WHERE SHOWN
6. ASSEMBLE FIND NO. 7 USING FIND NO. 8
7. THE ORIGINAL CONFIGURAT ON IS IDENIFIED BY DWG NO. AND A-000 SUFFIX

QTY REQD -011	QTY REQD -000	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	FIND NO.
1	—	1020210-011	RECORDER (REWORKED)	10
1	—	1006438	DIGITAL OHMMETER	9
AR	AR	MIL-S-40083, CL 31	SEALING & RETAINING COMPOUND	8
8	8	MS35200-42	SCREW, PAN HD	7
2	2	1014215-5	HANDLE ASSY	6
AR	AR	MIL-C-4003	CEMENT	5
1	1	1020085	PLATE, IDENTIFICATION, APOLLO	4
—	1	1006244	DIGITAL OHMMETER	3
4	4	MS35200-54	SCREW MACH FLATCSK HD	2
—	1	1020210-000	RECORDER (REWORKED)	1

LIST OF MATERIALS

2014059	
2014049	
1020344	
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ON FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL

INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327

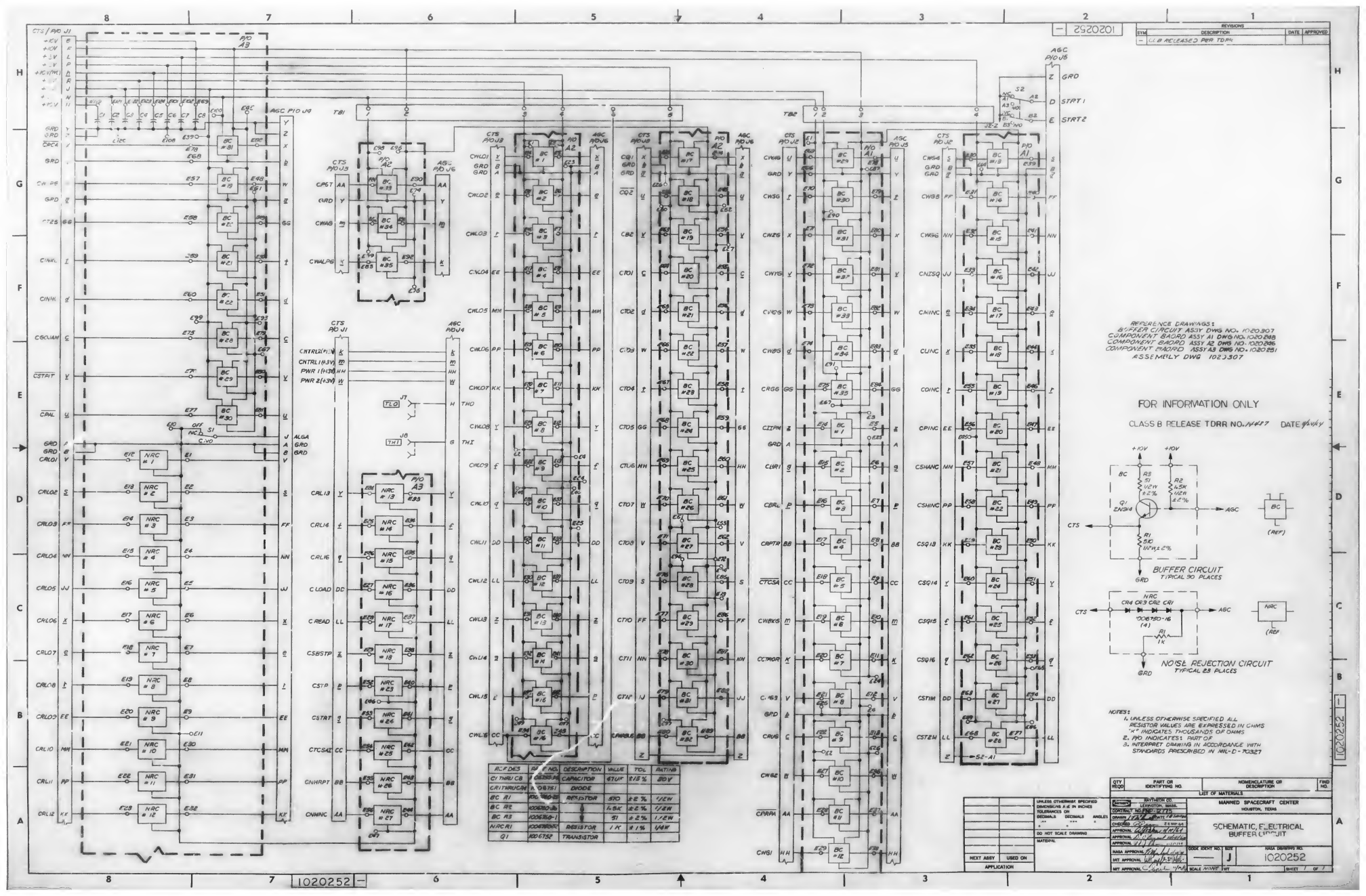
RAYTHEON CO. LEXINGTON, MASS.
CONTRACT NO NAS 9-497
DRAWN [signature] DATE 3/29/65
CHECKED [signature] DATE 12/29/64
APPROVAL [signature] 1/20/65
APPROVAL [signature] 1/26/65
APPROVAL [signature] 11-11
NASA APPROVAL [signature] 1/26/65
MIT APPROVAL [signature] 1/26/65
MIT APPROVAL [signature] 4/1/65

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

RECORDER AND DIGITAL OHMMETER ASSY

CODE IDENT NO. 49956 | SIZE D | NASA DRAWING NO. 1020211
SCALE 1/2 | WT | SHEET 1 OF 1

1020211 C


REFERENCE DRAWINGS:
BUFFER CIRCUIT ASSY DWG NO. 1020307
COMPONENT BOARD ASSY A1 DWG NO. 1020248
COMPONENT BOARD ASSY A2 DWG NO. 1020246
COMPONENT BOARD ASSY A3 DWG NO. 1020251
ASSEMBLY DWG 1023307
FOR INFORMATION ONLY
CLASS B RELEASE TDRR NO. N-427 DATE 9/4/64
BUFFER CIRCUIT
TYPICAL 90 PLACES
NOISE REJECTION CIRCUIT
TYPICAL 23 PLACES
NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL RESISTOR VALUES ARE EXPRESSED IN OHMS "K" INDICATES THOUSANDS OF OHMS
2. P/O INDICATES PART OF
3. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327
MANNED SPACECRAFT CENTER
HOUSTON, TEXAS
SCHEMATIC, ELECTRICAL
BUFFER CIRCUIT
1020252

REVISIONS						
SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED
A		REVISED PER TDRR 32505				

PROGRAM ASSEMBLY 1021108

MODULE B-21	MODULE B-22	MODULE B-23	MODULE B-24	MODULE B-28	MODULE B-29	PROGRAM SPECIFICATION			
								EFFECTIVITY	
PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	PART NO.	ASSEMBLY DASH NO.	FUNCTION	LAUNCH PERIOD	COMPUTER SERIAL NO.
1003733-451	1003733-461	1003733-471	1003733-481	1003733-491	1003733-51	-011 ONE EACH PER COMPUTER		N/A	
						B-21			
						B-22			
						B-23			
						B-24			
						B-28			
						B-29			
1003733-521	1003733-461	1003733-471	1003733-481	1003733-491	1003733-511	-021 ONE EACH PER COMPUTER	FLIGHT MISSION		AGE 122
						B-21			☒
						B-22			☒
						B-23			☒
						B-24			☒
						B-28			☒
						B-29			☒

☒ SYMBOL INDICATES MODULE REQUIRED

QTY REQD	PART OR IDENTIFYING NO	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO

LIST OF MATERIALS

NEXT ASSY	USED ON
ND 1000 000	

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS ± —— DECIMALS ± —— ANGLES ± ——
DO NOT SCALE THIS DRAWING

MATERIAL ——

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN
CHECKED
APPROVED
APPROVED
APPROVED
APPROVED MSC
DATE

MANNED SPACECRAFT CENTER
HOUSTON TEXAS

COMPUTER PROGRAM ASSEMBLY AS-501

CODE IDENT NO	SIZE	DRAWING NO
80230	D	1021108

SCALE —— SHEET 1 OF 1

1021108 A

REVISIONS TDRR 33014

SYM	ZONE	DESCRIPTION	DR	CHK	DATE	APPROVED

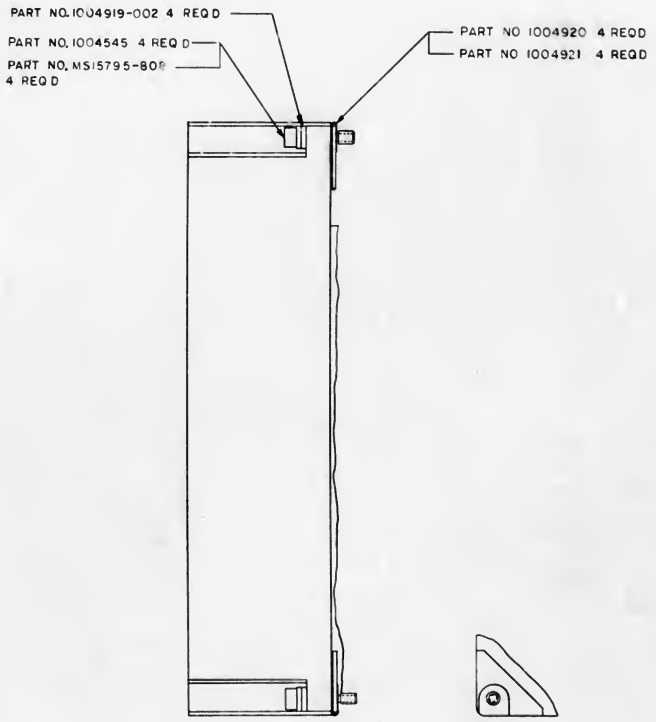


TABLE I	
PART NO.	MAKE FROM
1003563-051	1003563-031

NOTES:

1. MAKE FROM TABLE I
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327
3. RE-IDENTIFY IN ACCORDANCE WITH R.I.B. NO. 0104117

QTY REQD	PART OR IDENTIFYING NO.	MATERIAL OF NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.

LIST OF MATERIALS

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± ±
DO NOT SCALE THIS DRAWING
MATERIAL

NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN 17 MAR 1967
CHECKED 5 MAR 67
APPROVED
APPROVED 5/11
APPROVED 5/11
APPROVED MISC DATE

INSTRUCTION DRAWING FOR R.I.B. NO. 0104117
AGC KEYBOARD & DISPLAY MAIN PANEL

CODE IDENT NO. 80230 | SIZE D | DRAWING NO. 1023602
SCALE 1/1 | SHEET 1 OF 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: MYLAR TAPE 1.000±.003 WIDTH 3.500±.003 MILS THICK.
3. * DENOTES OPERATIONAL CHECK OUT PROCEDURE.

REVISIONS TDRA 31568

ZONE	LTR	DESCRIPTION	CHG. NO.	DATE	APPD

QTY	K START NO. AND REVISION	PROCESS SPEC. AND/OR OCP *	TITLE	EFF
2	G03LT.A8-K10504-00	LAV-560-809	LMP SEQUENCING TAPE	LTA 8

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON 2 PLACE 3 PLACE DECIMALS DECIMALS ANGLES + — + — + — — — —

DO NOT SCALE THIS DRAWING

MATERIAL SEE NOTE 2

APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP. MILWAUKEE WIS.

DRAWN D. DEKU DATE 26 SEPT 66
CHECKED D. WERGINZ
APPROVAL E.E. Bergman 30CT66
CONTRACT NAS 9-497
NASA APPROVAL
CCB APPROVAL 10/17/66

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

K-START TAPE ASSEMBLY

SIZE C | CODE IDENT NO. 99974 | 1026122

SCALE — | SHEET 1 OF 1

MIL-1052C P

1026122

6L292011

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. MATERIAL: MYLAR TAPE 1.000 ± .003 WIDE BY 3.5 ± .3 MILS THICK.

REVISIONS TDRR 37803

SYM	DESCRIPTION	CHG NO.	DATE	APPD

QTY	K-START NO. AND REVISION	AGC PROGRAM	TITLE	EFF
2	F10L006-K10545-00	LUMINARY1B	ALARMS & INTERRUPTS	LM-6

NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
FRACTIONS ± DECIMALS ± ANGLES ±
DO NOT SCALE THIS DRAWING

MATERIAL
SEE NOTE 2

APPROVAL

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS

DRAWN L. Agne 4 SEP 69
CHECKED Moye 5 SEP 69
APPROVAL K. Kosela
CONTRACT NAS 9-497

NASA APPROVAL N/A
APPROVAL Eckhart 9/9/69

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

K-START TAPE ASSEMBLY- ALARMS AND INTERRUPTS

SIZE	CODE IDENT NO.	
B	99974	1026279

SCALE —— SHEET 1 OF 1

MIL 10778 D 11 16 64

-171	-161	-151	-141	-131	-121	-111	-101	-091	-081	-071	-061	-051	-041	-031	-021	-011	EFFECTIVITY UNDEFINED	TITLE	REMARKS	FIND NO.
217	216	215	214	213	212	211	210	209	208	207	206	205	204	203	202	201	C & N EFFECTIVITY			
2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	2015578	ND 1002345	DESCRIPTION & REQUIREMENTS FOR COMPLETING ACC FORM 1 (REVISED)		46
2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577	2015577		+28 V BOOM 12 & 5% OPTICS POWER DISTRIBUTION BLOCK II C/M		45
2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576	2015576		0 VDC OPTICS DISTRIBUTION BLOCK II C/M		44
																		+28VDC OPTICS OPERATE DISTRIBUTION BLOCK II C/M		43
																				42
2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574	2015574		PULSE TORQUE POWER SUPPLY OUTPUT DISTRIBUTION BLOCK II C/M		41
2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573	2015573		BOOM 12 & 5% IMU POWER DISTRIBUTION BLOCK II C&M		40
2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572	2015572		0 VDC IMU DISTRIBUTION BLOCK II C/M		39
2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571	2015571		+28 VDC STANDBY POWER DISTRIBUTION BLOCK II C/M		38
2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570	2015570		+28VDC IMU OPERATE DISTRIBUTION BLOCK II C/M		37
PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000		MASTER END ITEM DETAIL SPECIFICATION - PART II G & N BLOCK II		36
PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000	PS2015000		MASTER END ITEM DETAIL SPECIFICATION - PART I A/G GEN EQUIPMENT - BLOCK II		35
PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000	PS2016000		PS PRODUCT CONFIGURATION AND ACCEPTANCE TEST REQUIREMENTS PROGRAM ANALYZER CONSOLE		34
																				33
																				32
ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500	ATP2015500		ATP FOR THE APOLLO G & N SYSTEM OPTICAL SUBSYSTEM BLOCK II		31
ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497	ATP2015497		ATP FOR APOLLO CSM INERTIAL SUBSYSTEM		30
																				29
																				28
2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507	2015507		OPTICAL SUBSYSTEM POWER DISTRIBUTION BLOCK II		27
																				26
2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505	2015505		SEXTANT OPTICS RESOLVER MODE BLOCK II		25
2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504	2015504		TRUNNION MANUAL MODE BLOCK II		24
2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503	2015503		SHAFT MANUAL MODE BLOCK II		23
2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502	2015502		ZERO OPTICS MODE BLOCK II		22
2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500	2015500		FUNCTIONAL DIAGRAM OPTICS SUBSYSTEM BLOCK II		21
																2001465		IMU TEMPERATURE CONTROL SYSTEM SCHEMATIC DIAGRAM - BLOCK II		20
ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319	ND1002319		ACE-SAE COMPUTER SUBPROGRAM C.M & LM G&N TESTING		19
											ND1002321	ND1002321	ND1002321		ND1002321			ACE G&N PROGRAMMING REQTS (D&O) BLK II		16
ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325	ND1002325		POST-INSTAL C/O FOR APOLLO G&N SYSTEMS BLK II		7
																				6
																				5
ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043	ND1021043		CSM BLOCK II PRIMARY GUIDANCE, NAVIGATION, AND CONTROL SYSTEM MANUAL		14
ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038	ND1021038		PACKING, SHIPPING & HANDLING MANUAL		3
ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039	ND1021039		AUXILIARY GROUND SUPPORT EQUIPMENT MANUAL		2
ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040	ND1021040		BENCH MAINTENANCE GSE CMRM		11
1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043	1021043		PRIMARY GUIDANCE, NAVIGATION AND CONTROL SYSTEM MANUAL		10
																				9
																				8
2015568	2015568	2015568	2015568	2015568	2015568	2015568	2015568	2015568	2015564	2015568	2015568	2015568	2015568	2015568	2015568	2015568		IMU CDU TIME MECH. BLOCK II		7
2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562	2015562		CSM SEXTS MODING (2 LINE MECH)		6
2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567	2015567		OPTICS TRUNNION & SHAFT CDU BLOCK DIAGRAM BLOCK II (2 LINE MECH)		5
2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566	2015566		IMU MEMO RADAR CDU BLOCK DIAGRAM BLOCK II (2 LINE MECH)		4
2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465	2001465		APOLLO IMU TEMPERATURE CONTROL SYSTEM-BLOCK II TWO WIRE MECHANIZATION		3
2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564	2015564		TWO WIRE MECHANIZATION OF APOLLO STABILIZATION LOOPS		2
2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563	2015563		TWO WIRE MECHANIZATION OF APOLLO PIPA LOOPS		1

NOTES:
1. THIS DRAWING FOR REFERENCE ONLY.
2. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED IN MIL-D-70327.

QTY REQD	PART OR IDENTIFYING NO	MATERIAL OR NOTES	NOMENCLATURE OR DESCRIPTION	FIND NO.
			LIST OF MATERIALS	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
CAPACITOR VALUES ARE IN μf
RESISTOR VALUES ARE IN OHMS
TOLERANCES ON
FRACTIONS DECIMALS ANGLES
± ± °
DO NOT SCALE THIS DRAWING
MATERIAL

ND 1000000
NEXT ASSY | USED ON
APPLICATION

MIT INSTRUMENTATION LAB
CAMBRIDGE, MASS.

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN
CHECKED
APPROVED
APPROVED
APPROVED MIT
APPROVED MSC

C & N COMMAND MODULE SUPPORTING DOCUMENT LIST BLOCK II

NOT APPLICABLE TO SKYLAB
NASA PP7-65-612

CODE IDENT NO 10320 | SIZE E | DRAWING NO. 2019999

DATE | SCALE | SHEET 1 OF 1

NOTES:
1. INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
2. THIS DRAWING IS FOR REFERENCE ONLY.
3. IN THE EVENT THE FRAME ASSEMBLY P/N 2021479-011 IS MOUNTED ON THE GNIC PANEL AND FLIGHT PANELS ARE NOT AVAILABLE BLANK PANEL P/N 2021485 MAY BE INSTALLED.

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	INITIAL RELEASE CLASS A PER TDRR 36322	11 JUN 68	FJP
	B	REVISED PER TDRR 36369	25 JUN 68	JJJ
	C	REVISED PER TDRR 36882	2 OCT 68	JJJ
	D	REVISED PER TDRR 37081	5 DEC 68	DKD
	E	REVISED PER TDRR 37338	14 FEB 69	SA
	F	REVISED PER TDRR 37502	15 APR 69	JJJ
	G	REVISED PER TDRR 37521	23 APR 69	JJJ
	H	REVISED PER TDRR 37645	10 JUN 69	JJJ
	J	REVISION STATUS CHANGED	8 OCT 69	JJJ
	K	REVISION STATUS CHANGED	28 OCT 69	RP
	L	REVISED PER TDRR 38052	9 MAR 70	JJJ
	M	REVISION STATUS CHANGED	9 DEC 70	JCD

				1	PANEL, INDICATOR - APOLLO 13 NOUN LIST		14
				1	MARKER, IDENTIFICATION - ALARM CODES		13
				1	PANEL, INDICATOR-ALIGNMENT PROCEDURES		12
				1	MARKER, IDENTIFICATION - ALARM & CHECKLIST CODES		11
				2	RETAINER, LAMP		10
				1	PANEL, BLANK		9
				1	PANEL, INDICATOR -VERB/NOUN LIST		8
				1	PANEL, INDICATOR-NORTHERN STAR CHART		7
				1	PANEL, INDICATOR-SOUTHERN STAR CHART		6
				1	FRAME ASSY, INDICATOR PANEL		5
	2021472		2021465	1	DECAL-OPTION, ALARM & CHECKLIST CODES		4
	2021473		2021466	1	PANEL, LAMP RETAINER-STAR LIST		3
	2021474		2021467	1	PANEL, LAMP RETAINER-VERB & NOUN LIST		2
	2021111-031		2021108-021	1	COMPUTER PROGRAM ASSY		1
CONFIGURATION DASH NO.	-031	-021	-011	QTY	NOMENCLATURE OR DESCRIPTION	REMARKS	FIND NO.
SPACECRAFT NO.	103	102	101				
FLIGHT NO.	APOLLO 8		APOLLO 7				

NEXT ASSY	USED ON
ND1000000	ND1000000
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE DECIMALS ± | 3 PLACE DECIMALS ± | ANGLES ±
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

MIT INSTRUMENTATION LAB
CAMBRIDGE MASS
DRAWN M. Dubner DATE 22-MAY 68
CHECKED Lunar 28114468
APPROVAL F.D. Young
CONTRACT NAS9-497
NASA APPROVAL
MIT APPROVAL W Shanley 7 June 68

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

FLIGHT PROGRAM ASSEMBLY—
BLOCK II C/M

SIZE C | CODE IDENT NO. 80230 | 2021469
SCALE NONE | SHEET 1 OF 2

2021469

MIL 10820C D

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	J	REVISED PER TDRR 37843	8 OCT 69	JJJ
	K	REVISED PER TDRR 37884	28 OCT 69	RP
	L	REVISED PER TDRR 38052	9 MAR 70	JJJ
	M	REVISED PER TDRR 38292	9 DEC 70	JCD

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	D	THIS SHEET ADDED PER TDRR 37081	5 DEC 68	DKD
	E	REVISED PER TDRR 37338	4 FEB 69	SA
	F	REVISED PER TDRR 37502	15 APR 69	MC
	G	REVISED PER TDRR 37521	23 APR 69	J.E.G
	H	REVISED PER TDRR 37645	10 JUN 69	J.M.

									14
									13
									12
									11
									10
	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	9
									8
									7
									6
									5
									4
									3
									2
									1
CONFIGURATION DASH NO.	-191	-181	-171	-161	-151	-141	-131	-121	FIND
SPACECRAFT NO.	119	118	117	116	115	114	113	112	NO.
FLIGHT NO.									

		2898996						1	PANEL, INDICATOR - APOLLO 13 NOUN LIST	14
	2899002	2898994						1	MARKER, IDENTIFICATION - ALARM CODES	13
			2898972	2898968				1	PANEL, INDICATOR ALIGNMENT PROCEDURES	12
			2898980	2898966	2021498			1	MARKER, IDENTIFICATION-ALARM & CHECKLIST CODES	11
	2021484	2021484	2021484	2021484	2021484		2021484	2	RETAINER, LAMP	10
SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	SEE NOTE 3	2021485	1	PANEL, BLANK	9
	2899004		2898967		2021499		2021486	1	PANEL, INDICATOR - VERB/NOUN LIST	8
					2021487		2021487	1	PANEL, INDICATOR - NORTHERN STAR CHART	7
					2021488		2021488	1	PANEL, INDICATOR - SOUTHERN STAR CHART	6
	2021479-011	2021479-011	2021479-011	2021479-011	2021479-011		2021479-011	1	FRAME ASSY, INDICATOR PANEL	5
							2021495	1	DECAL-OPTION, ALARM & CHECKLIST CODES	4
	2899003	2898995	2898971	2021473	2021473		2021473	1	PANEL, LAMP RETAINER - STAR LIST	3
								1	PANEL, LAMP RETAINER-VERB & NOUN LIST	2
	2021113-091	2021113-081	2021113-061	2021113-051	2021113-041		2021111-041	1	COMPUTER PROGRAM ASSEMBLY	1
CONFIGURATION DASH NO.	-111	-101	-091	-081	-071	-061	-051	-041	QTY	NOMENCLATURE OR DESCRIPTION	FIND NO.
SPACECRAFT NO.	111	110	109	108	107	106	105	104			
FLIGHT NO.		APOLLO 14	APOLLO 13	APOLLO 12	APOLLO 11	APOLLO 10		APOLLO 9			

ND1000000	ND1000000
NEXT ASSY	USED ON
APPLICATION	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ON
2 PLACE ± — 3 PLACE ± — ANGLES ± —
DO NOT SCALE THIS DRAWING
MATERIAL
APPROVAL

M I T
INSTRUMENTATION LAB
CAMBRIDGE MASS

DRAWN W. Dabbert DATE 5 DEC 68
CHECKED [illegible] DATE 11 DEC 68
APPROVAL E. G. GEARING
CONTRACT NAS9-497
NASA APPROVAL
MIT APPROVAL

MANNED
SPACECRAFT CENTER
HOUSTON, TEXAS

FLIGHT PROGRAM ASSEMBLY—
BLOCK II C/M

SIZE	CODE IDENT NO.	
C	80230	2021469

SCALE NONE | SHEET 2

APPLICATION	
NEXT ASSY	USED ON
2900712-011	2900712-011

REVISIONS				
	SYM	DESCRIPTION	DATE	APPROVAL
	A	REPLACES REV (-) WORD DWG WITH CHANGE PER MXC 207272	6 DEC 65	JWP / MEM
	B	REVISED PER MXC 207593	13 DEC 65	RLP / W. A
(M)	C	INITIAL RELEASE CLASS A PER TDRR 21761	14 DEC 65	GDR / Auth
M	D	REV. PER TDRR 25721	7 FEB 66	HTO / DWH
	E	REVISED PER TDRR 26737	8 MAR 66	R / AU

REV																														
SHEET																														
REV STATUS	REV							E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E	E
OF SHEETS	SHEET							1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18					

29 Nov 65

AC ELECTRONICS DIVISION
GENERAL MOTORS CORP MILWAUKEE WIS

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DRAWN C. M. Kulp 26 Nov 65 DATE
CHECKED Ed Foster 29 Nov 65
APPROVAL E Swenson 29 Nov 65
APPROVAL J. M. Watson 12-20-65

CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, BRANCHED W160

NASA APPROVAL a. mann-/R-3
MIT APPROVAL W Kyle, Wilson

CODE IDENT NO.	SIZE		REV
99974	A	2900665	E

CONTRACT NAS 9-497 SCALE SHEET 1 OF 18

NOTE NUMBER	GENERAL NOTES DESCRIPTION
1	SHIELD TERMINATION FIGURES ARE PER- A - ND1C02C71 B - ND1C02C32
2	INTERPRET DRAWING IN ACCORDANCE WITH STANDARDS PRESCRIBED BY MIL-D-70327.
3	APPLY LEAD IDENTIFICATIONS PER ND1C02C19. OMIT ALL SUFFIX LETTERS EXCEPT A AND B.
4	APPLY LEAD IDENTIFICATIONS TO SLEEVES PER ND1C02C19. LOCATE ADJACENT TO SOLDER SLEEVES.
5	APPLY REFERENCE DESIGNATIONS TO SLEEVES PER ND1C02019.
6	ASSEMBLE PER ND1C02032.
7	VENDOR ITEM - SEE SOURCE CONTROL OR SPECIFICATION CONTROL DRAWING.
8	FILL THE SPACE BETWEEN WIRE BUNDLE AND GROMMET OR CLAMP USING ITEM 17 TO SECURE WIRE BUNDLE IN THE STRAIN RELIEF CLAMP.
9	SECURE TO CABLE USING ITEM 14. MARKING TO READ AWAY FROM THE CONNECTOR ALIGN CENTER LINES OF BAND AND CONNECTOR MASTER KEY SLOT TO BE COLINEAR WITHIN + OR - 0.25 INCH.
10	MARK IDENTIFICATION BAND WITH REFERENCE DESIGNATION AS NOTED PER ND1C02C19. CENTRALIZE.
11	A LETTER WITH AN ASTERISK SUFFIX INDICATES A LOWER CASE LETTER.
12	SERIALIZE PER ND1C02023.
13	ASSEMBLE CONTACTS IN SPARE CONNECTOR INSERT HOLES, P2 ONLY.
14	IDENTIFY PER MIL-STD-130 (ES207) USING PART NUMBER.

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 2 OF 18

NOTE NUMBER	GENERAL NOTES DESCRIPTION
15	CRIMP BRAID PIGTAILS (3 EACH) IN E4.
16	ZIPPER TUBING MUST BE CUT TO PROVIDE A SIX INCH BRAID PIGTAIL AT JUNCTION END.
17	THE SUFFIX LETTER OF A LEAD IDENTIFICATION IDENTIFIES A SHIELD LEAD. COLOR, OR MARKED LETTER - A - FROM END SHIELD B - TO END SHIELD L - WHITE WITH BLUE TRACER R - WHITE WITH RED TRACER. Y - WHITE WITH YELLOW TRACER.
18	ZIPPER TUBING SHALL HAVE 2 TYPE TRACK WITH .003 + OR - .001 ALUMINUM FOIL.
19	SEE NOTES 15 AND 18.
20	SEPARATE GROUNDING STRIP FROM TUBING 4 TO 5 IN. AT CONNECTOR END. SECURE STRIP STITCHING AND REMOVE FREED BACKING FOIL AS REQUIRED. CUT OFF 2 INCHES OF STRIP AND TERMINATE IN E6-B, E7-B, AND E10-B RESPECTIVELY.
21	VENDOR ITEMS 13 SUPPLIED WITH ITEMS 1 AND 3, 14 AND 32 SUPPLIED WITH ITEM 2.

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 3 OF 18

NOTE NUMBER	GENERAL NOTES DESCRIPTION

LEAD TOLERANCE CHART

	JKT STRIP LG	SHIELD STRIP LG	LEAD CUT LG	INS STRIP LG
UNDER 3 INCHES	+.06-.06	+.06-.06	+.06-.06	+.06-.06
3 INCH TO 3 FT	+.25-.25	+.25-.25	+.25-.25	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 4 OF 18

SEE NOTE — LIST OF MATERIALS

NUMBER	ITEM	QTY	PART NO.	DESCRIPTION
7	1	1	1897247-005	CONNECTOR,PLUG-ELEC.
	2	1	MS3126F24-61PY	(ITEM97047-61)CONNECTOR,PLUG-ELEC.
7	3	1	1897249-003	CONNECTOR PLUG ELEC.
	4	1	2900665-001	WIRE, ND1C02181, TYPE 1 CLASS 1, 22 AWG, WHT., 992 FT. TOTAL LENGTH
	5	1	2900665-002	WIRE,ND1C02181,TYPE1,CLASS1,20AWG,WHT., 3 FT. TOTAL LENGTH
	6	1	2900665-003	WIRE,ND1C02181,TYPE2,CLASS4,WHT.,JKT.,22AWG, WHT/RED,WHT/BLU,266 FT. TOTAL LENGTH
	7	1	2900665-004	WIRE,ND1C02181,TYPE3,CLASS4,WHT.JKT.,22AWG, WHT/RED,WHT/BLU,WHT/YEL,175FT. TOTAL LENGTH
7	8	4	1010763- 2	SOLDER SLEEVE
7	9	1	1016129-011	BAND IDENTIFICATION
7	10	41	1010490-228	INSULATION SLEEVING
7	11	4	1010490-256	INSULATION SLEEVING
7	12	4	1010666-002	SPLICE REDUCER
21	13		1897190- 2	CONTACT SOCKET
21	14		MS3192A20A	CONTACT PIN
7	15	1	1010433-105	CLAMP STRAIN RELIEF
7	16	1	1010433-104	CLAMP STRAIN RELIEF

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 5 OF 18

LIST OF MATERIALS

SEE NOTE NUMBER	ITEM	QTY	PART NO.	DESCRIPTION
	17	AR	MIL-I-631	FILLER TAPE TYPE F, FORM S(BLACK), GRADE A CLASS 1, 5/8 WIDE, .02 THICK
	18	AR	MIL-T-713	LACING TAPE,TYPE P,CLASS2 BLACK(FS2732 NO.181)
7	19	5	1016126-041	BAND IDENTIFICATION
7	20	1	1016282- 18	GROMMET
	21	1	1016282- 16	GROMMET
	22		2900665-005	DELETED
19	23	1	2900665-006	ZIPPER TUBING PER ND1002155, TYPE III 1.25 DIA 10 FT TOTAL LENGTH
19	24	1	2900665-007	ZIPPER TUBING PER ND1002155, TYPE III 1.00 DIA 21 FT TOTAL LENGTH
	25		2900665-008	DELETED
	26		2900665-009	DELETED
	27		2900665-010	DELETED
7	28	→ 1	1016000-004	SPLICE REDUCER
7	29	→ 1	1015490-402	INSULATION SLEEVING
7	30	3	1015902- 44	TERMINAL LUG
19	31	1	2900665-011	ZIPPER TUBING PER ND1002155, TYPE III, .75 DIA, 22.5 FT TOTAL LENGTH.
21	32		1016282- 24	GROMMET

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 6 OF 10

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JNT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	1		DELETED									
A	1B		DELETED									
A	1L		DELETED									
A	1R		DELETED									
A	2		DELETED									
A	2B		DELETED									
A	2L		DELETED									
A	2R		DELETED									
A	3		DELETED									
A	3B		DELETED									
A	3L		DELETED									
A	3R		DELETED									

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 7 OF 10

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JNT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	4		DELETED									
A	4B		DELETED									
A	4L		DELETED									
A	4R		DELETED									
A	5	7		2.50 2.50	2.00 2.00					B,7 B,7	10 10	
A	5L		P1-43 P3-78					.15 .15	NO NO		13 13	
A	5R		P1-44 P3-51					.15 .15	NO NO		13 13	
A	5Y		P1-24 P3-77					.15 .15	NO NO		13 13	
A	6	7		2.50 2.50	2.00 2.00					B,7 B,7	10 10	
A	6L		P1-23 P3-79					.15 .15	NO NO		13 13	
A	6R		P1-42 P3-76					.15 .15	NO NO		13 13	
A	6Y		P1-41 P3-49					.15 .15	NO NO		13 13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 8 OF 10

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JNT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	7	7		2.50 2.50	2.50 2.50					B,7 B,7	10 10	
A	7L		P1-10 P3-48					.15 .15	NO NO		13 13	
A	7R		P1-22 P3-28					.15 .15	NO NO		13 13	
A	7Y		P1-9 P3-40					.15 .15	NO NO		13 13	
A	8	7		2.50 2.50	2.50 2.50					B,7 B,7	10 10	
A	8L		P1-46 P3-4					.15 .15	NO NO		13 13	
A	8R		P1-45 P3-2					.15 .15	NO NO		13 13	
A	8Y		P1-47 P3-27					.15 .15	NO NO		13 13	
A	9	8		2.50 2.50	2.50 2.50					B,7 B,7	10 10	
A	9L		P1-49 P3-66					.15 .15	NO NO		13 13	
A	9R		P1-48 P3-41					.15 .15	NO NO		13 13	
A	10	7		2.50 2.50	2.50 2.50					B,7 B,7	10 10	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 9 OF 10

CABLE ASSEMBLY W160 2900665 E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	10L		P1-27 P3-10					.15 .15	NO NO		13 13	
A	10R		P1-28 P3-3					.15 .15	NO NO		13 13	
A	10Y		P1-26 P3-23					.15 .15	NO NO		13 13	
A	11	6			3.40 3.80	3.00 3.00				B,7 B,7	10 10	
A	11L		P1-11 P3-67					.15 .15	NO NO		13 13	
A	11R		P1-25 P3-42					.15 .15	NO NO		13 13	
A	12	7			3.80 3.80	3.00 3.00				B,7 B,7	10 10	
A	12L		P1-13 P3-11					.15 .15	NO NO		13 13	
A	12R		P1-12 P3-12					.15 .15	NO NO		13 13	
A	12Y		P1-4 P3-24					.15 .15	NO NO		13 13	
A	13	6			3.80 3.80	3.00 3.00				B,7 B,7	10 10	
A	13L		P1-1 P3-68					.15 .15	NO NO		13 13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 10 OF 18

CABLE ASSEMBLY W160 2900665 E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	13R		P1-3 P3-43					.15 .15	NO NO		13 13	
A	14	7			3.80 3.80	3.00 3.00				B,7 B,7	10 10	
A	14L		P1-51 P3-26					.15 .15	NO NO		13 13	
A	14R		P1-53 P3-27					.15 .15	NO NO		13 13	
A	14Y		P1-52 P3-25					.15 .15	NO NO		13 13	
A	15	7			3.80 3.80	3.00 3.00				B,7 B,7	10 10	
A	15L		P1-54 P3-69					.15 .15	NO NO		13 13	
A	15R		P1-53 P3-44					.15 .15	NO NO		13 13	
A	15Y		P1-31 P3-18					.15 .15	NO NO		13 13	
A	16	7			3.80 3.80	3.00 3.00				B,7 B,7	10 10	
A	16L		P1-29 P3-47					.15 .15	NO NO		13 13	
A	16R		P1-30 P3-71					.15 .15	NO NO		13 13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 11 OF 18

CABLE ASSEMBLY W160 2900665 E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	16Y		P1-32 P3-46					.15 .15	NO NO		13 13	
A	17	7			3.80 3.80	3.50 3.50				B,7 B,7	10 10	
A	17L		P1-15 P3-70					.15 .15	NO NO		13 13	
A	17R		P1-14 P3-45					.15 .15	NO NO		13 13	
A	17Y		P1-16 P3-72					.15 .15	NO NO		13 13	
A	18	6			3.80 3.80	3.50 3.50				B,7 B,7	10 10	
A	18L		P1-2 P3-8					.15 .15	NO NO		13 13	
A	18R		P1-5 P3-7					.15 .15	NO NO		13 13	
A	19	6			3.80 3.80	3.50 3.50				B,7 B,7	10 10	
A	19L		P1-7 P3-21					.15 .15	NO NO		13 13	
A	19R		P1-8 P3-1					.15 .15	NO NO		13 13	
A	20		DELETED									

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 12 OF 18

CABLE ASSEMBLY W160 2900665 E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A	21		DELETED									
A	22	6			2.80 4.50	2.50 4.00				A,6A B,7	B, 10 10	
A	22A	4	SHLD A22 E1-8					.25 .38	NO NO			
A	22L		P2-N6 P3-40					.22 .15	NO NO		14 13	
A	22R		P2-N6 P3-38					.22 .15	NO NO		14 13	
A	23	6			2.80 4.50	2.50 4.00				A,6A B,7	B, 10 10	
A	23A	4	SHLD A23 E1-8					.25 .38	NO NO			
A	23L		P2-P6 P3-4					.22 .15	NO NO		14 13	
A	23R		P2-N6 P3-5					.22 .15	NO NO		14 13	
A	24	6			2.80 4.50	2.50 4.00				A,6A B,7	B, 10 10	
A	24A	4	SHLD A24 E1-8					.25 .38	NO NO			
A	24L		P2-P6 P3-65					.22 .15	NO NO		14 13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 13 OF 18

CABLE ASSEMBLY W160 — 2900665 — E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	TERM.JKT AREA STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A 24R			P2-S*					.22	NO		14	
			P3-64					.15	NO		13	
A 25	5				2.80 4.30	2.50 4.30				A;6A B;7	8, 10 10	
A 25A	4		SHLD A25					.25	NO			
			E1-B					.37	NO			
A 25L			P2-R*					.22	NO		14	
			P3-63					.15	NO		13	
A 25R			P2-Q*					.22	NO		14	
			P3-62					.15	NO		13	
A 26	5		E1-L					.38	NO			
			P2-*					.22	NO		14	
A 27	4		P2-PP					.22	NO		14	
			P3-3*					.15	NO		13	
A 28	4		P2-NN					.22	NO		14	
			P3-15					.15	NO		13	
A 29	4		P2-MM					.22	NO		14	
			P3-14					.15	NO		13	
A 30	4		P2-LL					.22	NO		14	
			P3-61					.15	NO		13	
A 31	4		P2-KK					.22	NO		14	
			P3-60					.15	NO		13	
A 32	4		P2-JJ					.22	NO		14	
			P3-*					.15	NO		13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 14 OF 18

CABLE ASSEMBLY W160 — 2900665 — E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	TERM.JKT AREA STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A 33	4		P2-HH					.22	NO		14	
			P3-35					.15	NO		13	
A 34	4		P2-GG					.22	NO		14	
			P3-59					.15	NO		13	
A 35	4		P2-FF					.22	NO		14	
			P3-58					.15	NO		13	
A 36	4		P2-E					.22	NO		14	
			P3-36					.15	NO		13	
A 37	4		P2-P					.22	NO		14	
			P3-65					.15	NO		13	
A 38	4		P2-R					.22	NO		14	
			P3-66					.15	NO		13	
A 39	4		P2-AA					.22	NO		14	
			P3-37					.15	NO		13	
A 40	4		P2-T					.22	NO		14	
			P3-19					.15	NO		13	
A 41	4		P2-U*					.22	NO		14	
			P3-61					.15	NO		13	
A 42	4		P2-EE					.22	NO		14	
			P3-56					.15	NO		13	
A 43	4		P2-BB					.22	NO		14	
			P3-17					.15	NO		13	
A 44	4		P2-CC					.22	NO		14	
			P3-33					.15	NO		13	

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 15 OF 18

CABLE ASSEMBLY W160 — 2900665 — E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	TERM.JKT AREA STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A 45	4		P2-BB					.22	NO		14	
			P3-34					.15	NO		13	
A 46	4		P2-AA					.22	NO		14	
			P3-A					.15	NO		13	
A 47	4		P2-Z*					.22	NO		14	
			P3-17					.15	NO		13	
A 48	4		P2-H					.22	NO		14	
			P3-33					.15	NO		13	
A 49	4		P2-Y*					.22	NO		14	
			P3-54					.15	NO		13	
A 50	4		P2-J					.22	NO		14	
			P3-*					.15	NO		13	
A 51	4		P2-W*					.22	NO		14	
			P3-55					.15	NO		13	
A 52	4		P2-K					.22	NO		14	
			P3-31					.15	NO		13	
A 53	4		P2-X*					.22	NO		14	
			P3-53					.15	NO		13	
A 54	4		P2-L					.22	NO		14	
			P3-57					.15	NO		13	
A 55	5		E6-B6					.38	NO			
			E5					.20	NO			
A 56	5		E7-B6					.38	NO			
			E8					.20	NO			

SIZE	CODE IDENT NO.	
A	99974	2900665

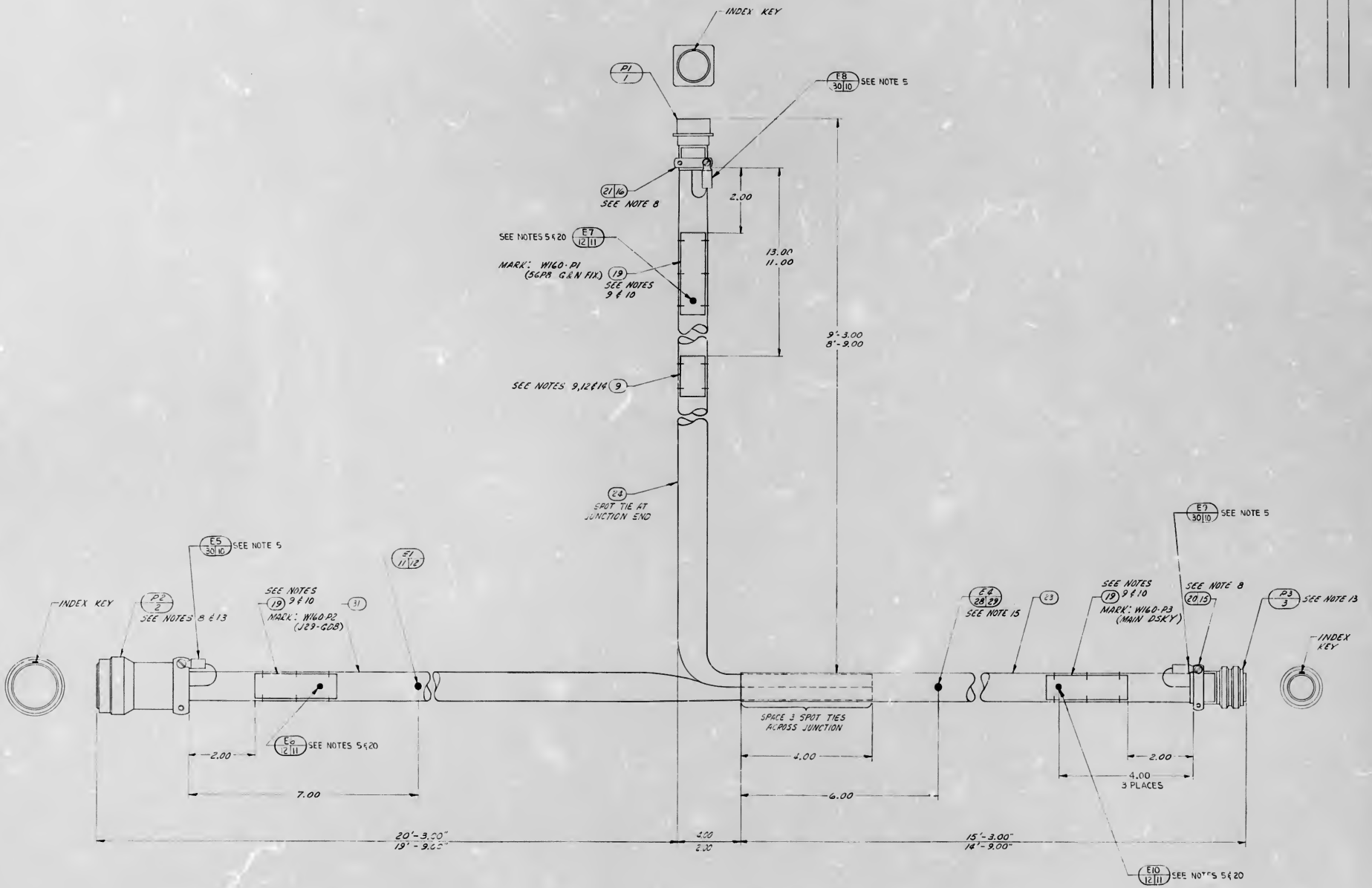
SCALE-NONE | REV LTR E | SHEET 16 OF 18

CABLE ASSEMBLY W160 — 2900665 — E

LEAD IDENT	WIRE MATL ITEM	LEAD LG	CIRCUIT PT FROM (A) TO (B)	TERM.JKT AREA NO.	TERM.JKT AREA STRIP LG	SHLD STRIP LG	LEAD CUT LG	INS STRIP LG	TIN	NOTE ONE, FIG	ACCESSORY ITEMS	REMARKS
A 57	5		E10-B8					.38	NO			
			F9					.20	NO			

SIZE	CODE IDENT NO.	
A	99974	2900665

SCALE-NONE | REV LTR E | SHEET 17 OF 18



REVISIONS TDRR 24731

ZONE	LTR	DESCRIPTION	CHG NO	DATE	APPROVED
		SEE SHEET 1 FOR REVISION RECORD			

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ON FRACTIONS ± DECIMALS ± .30 ANGLES ±	AC ELECTRONICS DIVISION GENERAL MOTORS CORP MILWAUKEE WIS	MANNED SPACECRAFT CENTER HOUSTON TEXAS	
DO NOT SCALE THIS DRAWING	DRAWN C. Leigh 2-14-67	CABLE ASSEMBLY, SPECIAL PURPOSE, ELECTRICAL, BRANCHED W160	
MATERIAL	CHECKED		
NEXT ASSY USED ON	APPROVAL		
APPLICATION	APPROVAL	CODE IDENT NO 99974	SIZE E 2900665
	NASA APPROVAL	SCALE FULL	SHEET 18 OF 18
	MIT APPROVAL		

2900665 E

G & N EQUIPMENT
JOB HISTORICAL RECORD

JDC 00001 REV. D PAGE 1 OF 1
INITIAL TDRR 19621 D.S. PGS 25

SUBSYSTEM DESCRIPTION INERTIAL

ASSY.

Rev. Let.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA
A	7-13-65	20794	ALL	ALL	WK	WJR
B	8-31-65	22017	-	2	WK	TM
C	11 16 65	24083	-	17, 18	VK	-
D	11 16 65	24084	-	1	WK	-

REFERENCES

IMPORTANT The Data Sheets shall be up dated as necessary during ISS Testing.

INTERVAL As Required

TOOLS AND MATERIAL

IMPORTANT: The data sheets must be kept up to date throughout ISS testing.

PROCEDURE:

1. On the accompanying data sheets record the following:
   a. ACSK Serial Number (S/N) of all the modules and/or components listed on the data sheets.
   b. Under the Remarks Column record any Acceptance problems, Waivers, or MRB's that have been written against the module.
   c. Any time that a module and/or a component is replaced, or exchanged, record the (S/N) and record the reason for the action and date in the Remarks Column.

VERIFICATION WITH SIDL REQUIRED BEFORE USE DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 1 OF 25

NO. 00001 JDC
REV. D
INITIAL TDRR 19621

JOB

ASSEMBLY UNDER TEST
TITLE
SER. NO. DWG REV.

TEST HISTORY
START ISS TESTING DATE
COMPLETED ISS TESTING DATE

MAJOR GROUND SUPPORT EQUIPMENT
NAME SER. NO. CAL DATE
NAME SER. NO. CAL DATE

DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
IMU Assembly No. 1001500			
X PIP Pre-Amp Assembly No. 1008285			
Y PIP Pre-Amp Assembly No. 1008285			
Z PIP Pre-Amp Assembly No. 1008285			
IRIG Pre-Amp Assembly No. 1008284			
Inner Gimbal Axis ADA No. 1000097			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 2 OF 25

NO. 00001 JDC
REV. D
INITIAL TDRR 19621

DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
Middle Gimbal Axis ADA No. 1000097			
Outer Gimbal Axis ADA No. 1000097			
Inner Gimbal Axis ADA Pre Amp No. 1007263			
Middle Gimbal Axis ADA Pre Amp No. 1007255			
Outer Gimbal Axis ADA Pre Amp No. 1007255			
X IRIG Pre-Aligned Assembly No. 1000012			
Y IRIG Pre-Aligned Assembly No. 1000012			
Z IRIG Pre-Aligned Assembly No. 1000012			
X PIP Pre-Aligned Assembly No. 1000013			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 3 OF 25

NO. 00001 JDC
REV. D
INITIAL TDRR 19621

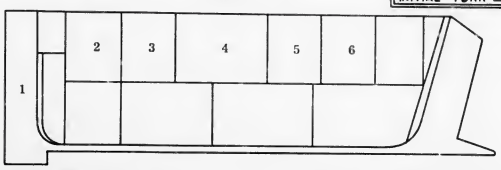
DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
Y PIP Pre-Aligned Assembly No. 1000013			
Z PIP Pre-Aligned Assembly No. 1000013			

26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 4 OF 25

JDC
NO. 00001
REV D
INITIAL TDRR 19621

TRAY 1



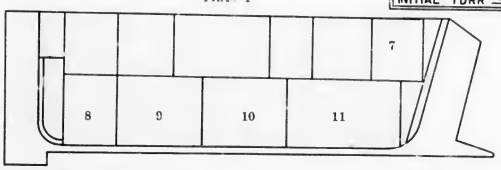
REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 1 No. 1007571			
2	3200 CPS AAC, Filter and Multivib. No. 1007543			
3	Temperature Controller Power Supply 3200 CPS 20V No. 1007545			
4	-28 VDC Power Supply No. 1007542			
5	OG Coarse Align Ampl. No. 1007541			
6	MG Coarse Align Ampl. No. 1007541			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 5 OF 25

JDC
NO. 00001
REV D
INITIAL TDRR 19621

TRAY 1



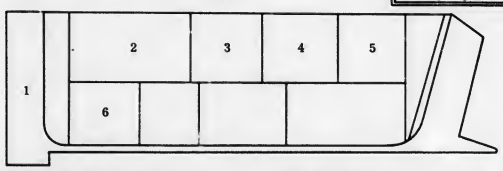
REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	IG Coarse Align Ampl. No. 1007541			
8	3200 CPS 1% Power Ampl. No. 1007544			
9	OG Servo Ampl. No. 1007540			
10	MG Servo Ampl. No. 1007540			
11	IG Servo Ampl. No. 1007540			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 6 OF 25

JDC
NO. 00001
REV D
INITIAL TDRR 19621

TRAY 2



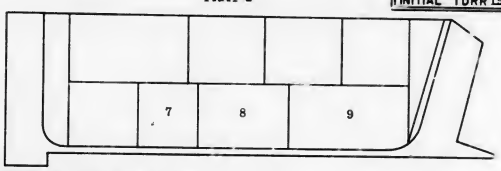
REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 2 No. 1007572			
2	Pulse Torquing Power Supply No. 1007552			
3	25.6 KC Power Supply No. 1007549			
4	25.6 KC Encoder Excitation Power Supply No. 1007549			
5	IMU - CDU Load Compensation No. 1007550			
6	Failure Indicator No. 1007551			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 7 OF 25

JDC
NO. 00001
REV D
INITIAL TDRR 19621

TRAY 2



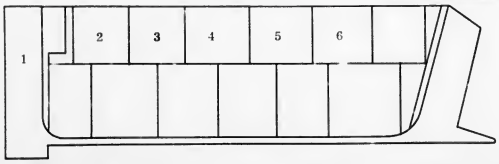
REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	800 CPS 1% Power Ampl. No. 1007547			
8	800 CPS AAC, Filter and Multivib. No. 1007546			
9	800 CPS 5% Power Ampl. No. 1007548			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 8 OF 25

NO. 00001 JDC
REV. D
INITIAL TDRR 19621

TRAY 3



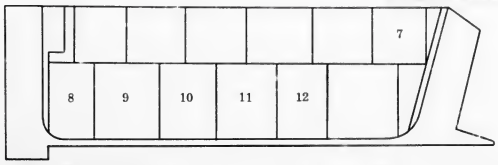
REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 3 No. 1007573			
2	X PIPA DC Diff. Ampl. & PVR No. 1007507			
3	Y PIPA DC Diff. Ampl. & PVR No. 1007507			
4	X PIPA Binary Current Switch No. 1007527			
5	X PIPA Interrogator No. 1007519			
6	X PIPA Diff. Ampl. No. 1007517			

DATE 26 MAY 65

APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 9 OF 25

NO. 00001 JDC
REV. D
INITIAL TDRR 19621

TRAY 3



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	X IRIG Diff. Ampl. & PVR No. 1007507			
8	X PIPA Calibration No. 1007509			
9	Y PIPA Calibration No. 1007509			
10	Y PIPA Binary Current Switch No. 1007527			
11	Y PIPA Interrogator No. 1007519			
12	Y PIPA AC Diff. Ampl. No. 1007517			

DATE 26 MAY 65

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 10 OF 25

NO. 00001 JDC
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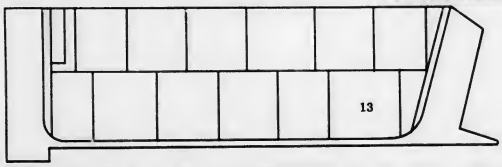
INITIAL TDRR 19621

TRAY 3



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
13	X IRIG Pulse Torque Gyro Calibration No. 1007521			

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APOLLO G&N
EQUIPMENT HISTORICAL RECORD
DATA SHEET 11 OF 25

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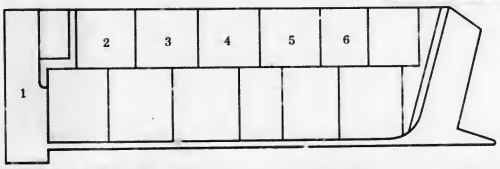
TRAY 4



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 4 No. 1007574			
2	Z PIPA DC Diff. Ampl. & PVR No. 1007507			
3	Z PIPA Interrogator No. 1007519			
4	Z PIPA AC Diff. Ampl. No. 1007517			
5	Y IRIG Ternary Current Switch No. 1007516			
6	Z IRIG DC Diff. Ampl. & PVR No. 1007507			

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 12 OF 25

NO. 00001 JDC
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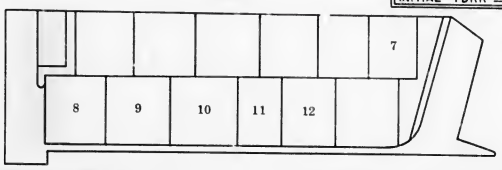
TRAY 4



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	Z IRIG Ternary Current Switch No. 1007516			
8	Z PIPA Calibration No. 1007509			
9	Z PIPA Binary Current Switch No. 1007527			
10	Y IRIG Pulse Torque Gyro Calibration No. 1007521			
11	Y IRIG DC Diff. Ampl. & PVR No. 1007507			
12	Z IRIG Pulse Torque Gyro Calibration No. 1007521			

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 13 OF 25

NO. 00001 JDC
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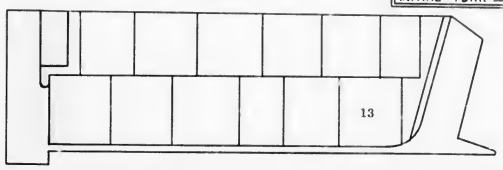
TRAY 4



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
13	X IRIG Ternary Current Switch No. 1007516			

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EQUIPMENT HISTORICAL RECORD
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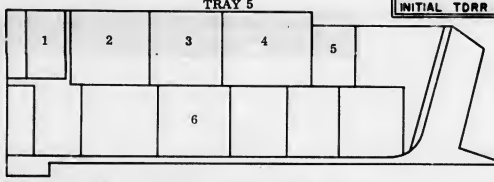
TRAY 5



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 5 No. 1007575			
2	OG CDU Encoder No. 1007554			
3	MG CDU Encoder No. 1007554			
4	IG CDU Encoder No. 1007554			
5	CDU Zeroing and Lock Relay No. 1007561			
6	Forward-Backward Counter and Computer Output No. 1007558			

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 15 OF 25

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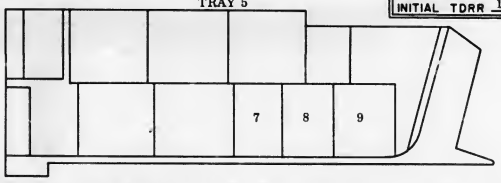
TRAY 5



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	OG CDU DAC No. 1007555			
8	MG CDU DAC No. 1007555			
9	IG CDU DAC No. 1007555			

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EQUIPMENT HISTORICAL RECORD
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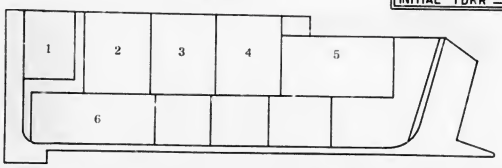
TRAY 6



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 6 No. 1007576			
2	OG CDU Motor Drive Ampl. and Selector Ckt. No. 1007557			
3	MG CDU Motor Drive Ampl. and Selector Ckt. No. 1007557			
4	IG CDU Motor Drive Ampl. and Selector Ckt. No. 1007557			
5	CDU Resolver Loads No. 1007510			
6	800 CPS 5% Power Ampl. No. 1007548			

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EQUIPMENT HISTORICAL RECORD
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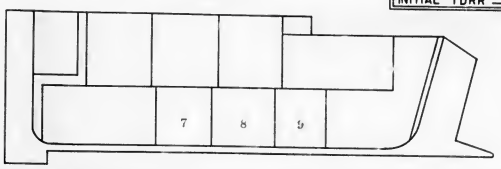
TRAY 6



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	800 CPS AAC, Filter and Multivib. No. 1007546			
8	No. 1007546 800 CPS 1% Power Ampl. No. 1007547			
9	CDU Zeroing Transformer, Relays, and Entry Relays No. 1007564			

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EQUIPMENT HISTORICAL RECORD
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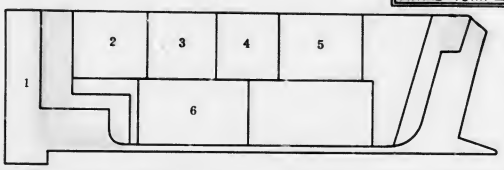
TRAY 7



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 7 No. 1007577			
2	Shaft CDU Encoder No. 1007554			
3	Trunnion CDU Encoder No. 1007554			
4	CDU Fixed Resolution Transformation and Entry Module No. 1007563			
5	IMU Temperature Controller No. 1007556			
6	Pulse Torquing Power Supply No. 1007552			

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EQUIPMENT HISTORICAL RECORD
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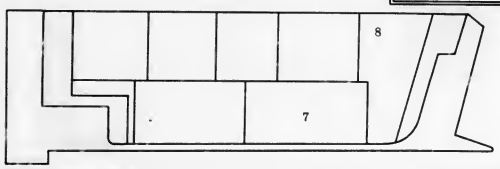
TRAY 7



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	IMU Temperature Indicating Alarm & Backup Controller No. 1007518			
8	PVR Delay Circuitry No. 1007218			

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EQUIPMENT HISTORICAL RECORD
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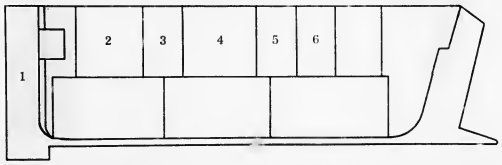
TRAY 8



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 8 No. 1007578			
2	Buffer Circuit No. 1007526			
3	Two Speed Switch No. 1007522			
4	Relay No. 1007567			
5	SCT Moding No. 1007528			
6	Shaft CDU DAC No. 1007555			

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 21 OF 25

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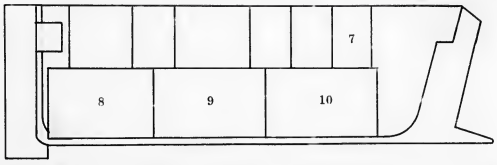
TRAY 8



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	Trunnion CDU DAC No. 1007555			
8	SXT Trunnion Motor Drive Ampl. No. 1007581			
9	SXT Shaft Motor Drive Ampl. No. 1007581			
10	SCT Shaft Motor Drive Ampl. No. 1007581			

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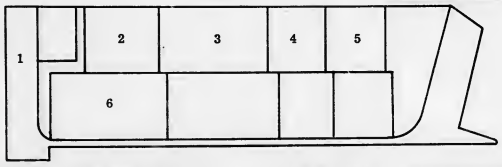
TRAY 9



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 9 No. 1007579			
2	Buffer Circuits No. 1007526			
3	SCT Trunnion Motor Drive Ampl. No. 1007581			
4	Relays No. 1007567			
5	Two Speed Switch No. 1007522			
6	Trunnion CDU Motor Drive Ampl. No. 1007581			

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EQUIPMENT HISTORICAL RECORD
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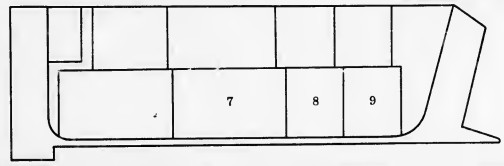
TRAY 9



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	Shaft CDU Motor Drive Ampl. No. 1007581			
8	Resolver Drive Amplifier No. 1007651			
9	Cosecant Generator No. 1007524			

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EQUIPMENT HISTORICAL RECORD
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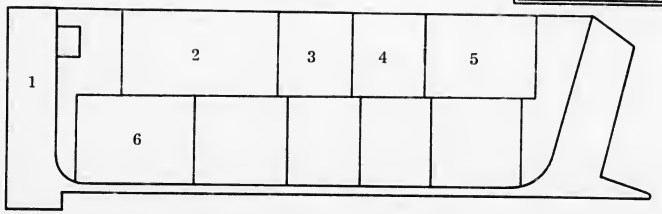
TRAY 10



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
1	Frame Assembly Tray 10 No. 1007580			
2	Photometer Electronics No. 1007559			
3	G & N Subsystem Supply Filter (Optics operate) No. 1007590			
4	G & N Subsystem Supply Filter No. 1007590			
5	G & N Subsystem Supply Filter (operate) No. 1007590			
6	800 CPS 5% Power Ampl. No. 1007548			

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EQUIPMENT HISTORICAL RECORD
DATA SHEET 25 OF 25

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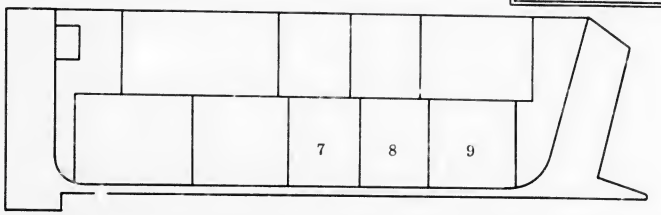
TRAY 10



REF. NO.	DESCRIPTION & PART NUMBER	S/N	REMARKS	INSP.
7	Modulator and Loop Compensation No 1007511			
8	800 CPS Compensation No. 1007591			
9	Signal Conditioner Power Supply No. 1007525			

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REMOVE AND REPLACE
JOB PGNCS COMPONENTS (LEM)

JDC 17601 REV. A PAGE 1 OF 5
INITIAL TDRR 30999 DS PGS 0

SUBSYSTEM Guidance and Navigation

ASSY.

DESCRIPTION Removal and replacement of primary guidance navigation and control system (PGNCS) components during system G & N Lab testing, or during disassembly of PGNCS after testing is completed.

Rev. Ltr.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA
A	9-26-68	36861	1	-	EA	-

REFERENCES JDC's 12614, 16013 and 12610.

IMPORTANT See below.

INTERVAL As required

TOOLS AND MATERIAL 1. Standard tool kit
2. Torque wrench
3. Component cart
4. Additional items, if needed, listed in table.

IMPORTANT

Read all applicable cautions and notes in table I before removing or replacing a PGNCS component. All components must be removed with extreme care. The PGNCS contains delicate, sensitive instruments and has critical mounting surfaces and vulnerable connector pins and sockets.

Refer to JDC 18100 for lubrication instructions prior to engaging any screw or bolt into header helicoil inserts, and for helicoil insert cleaning instructions after all testing has been completed or prior to spacecraft installation.

A. PREPARATION

NOTE: If component is to be replaced, obtain spare component.

1. Obtain tools and material listed for PGNCS component to be removed or replaced.
2. Perform JDC 12614.

B. REMOVAL AND REPLACEMENT

1. See JDC 12610 for coolant hose connection information.

CAUTION: All electrical connectors with jacking screws shall be removed and installed with extreme care to maintain proper alignment to avoid damaging pins or sockets.

2. See table I for removal and replacement requirements.

VERIFICATION WITH SHOL REQUIRED BEFORE USE

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Table I. Removal and Replacement Procedures

Component to be Removed or Replaced	Remarks	Replacement Requirements: Electrical Connections	Replacement Requirements: Mounting Screw Torque (inch-pounds)
Computer control and reticle dimmer assembly		CCPDA, P1 at P2 of cable W-135; J1 at P3 of cable W-135	No special requirement in G & N Lab; rests on unused portion of component mounting plate of SMF.
LGC	NOTES: 1. It is necessary, to improve accessibility and avoid damage to the thermal interface of LGC with coldplate, to disconnect and remove LGC buffer assembly and its mount from above the LGC. 2. Use two flat washers per mounting screw. Insure mounting screws are tightened evenly to provide good contact between the LGC and the LGC coldplate. 3. Insure that the LGC coldplate is purged and filled.	LGC, A51 at P6 of cable W-259	14 mounting screws evenly torqued, in 8 inch-pound increments, 60 to 75 inch-pounds.
DSKY		DSKY, J9 at P1 of cable W-143	No special torque requirements for mounting screws.
PSA to/from coldplate on component mounting plate	NOTES: 1. It is necessary, to improve accessibility and avoid damage to to thermal interface of PSA with coldplate, to remove DSKY and/or DSKY mounting bracket from proximity of PSA.	"A" Harness between 56P2 and 45J19	18 mounting screws evenly torqued, in 3 inch-pound increments, 20 to 25 inch-pounds when PSA is without a cover;

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Table I. Removal and Replacement Procedures (cont)

Component to be Removed or Replaced	Remarks	Replacement Requirements: Electrical Connections	Replacement Requirements: Mounting Screw Torque (inch-pounds)
(cont)	NOTES: (cont) 2. Use two flat washers per mounting screw. Insure screws are tightened evenly to provide good contact between PSA and coldplate.		with a cover use 28 mounting screws evenly torqued in 3 inch-pound increments, 20 to 25 inch-pounds.
IMU to/from IMU mounting fixture	In accordance with JDC 16013. CAUTION: Insure the portable temperature controller is connected and operating when the coolant and power console is not used. Insure the IMU is purged and filled. IMU and PTA are matched components and must be replaced together.	IMU, J2 at P20 of cable W-146; IMU, J1 at P21 of cable W-146	4 mounting bolts evenly torqued in 8 inch-pound increments 55 to 65 inch-pounds.
PTA to/from PTA/PEA mounting fixture coldplate	NOTES: 1. IMU and PTA are matched components and must be replaced together. 2. Insure mounting screws are tightened evenly to provide good contact between the PTA header assembly and the PTA/PEA coldplate. 3. Insure that the PTA/PEA coldplate is purged and filled. 4. Rotary table tilt axis to be approximately 0° and rotary axis approximately -150°.	PTA, J18 at P2 of cable W-144; PTA, J19 at P19 of cable W-146	23 mounting screws evenly torqued, in 3 inch-pound increments, 29 to 32 inch-pounds.

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Table I. Removal and Replacement Procedures (cont)

Component to be Removed or Replaced	Remarks	Replacement Requirements: Electrical Connections	Replacement Requirements: Mounting Screw Torque (inch-pounds)
CDU to/from coldplate on component mounting plate on SMF	NOTES: 1. Improve accessibility and avoid damage to thermal interface of CDU with coldplate by disconnecting and removing TPA and mount from above CDU. 2. Use two flat washers per mounting screw. Insure mounting screws are tightened evenly to provide good contact between the CDU header and the CDU coldplate. 3. Insure that the CDU coldplate is purged and filled.	CDU, 40J53 at P3 of cable W-133	12 mounting screws evenly torqued, in 3 inch-pound increments, 29 to 32 inch-pounds.
PGNCS interconnect harness group (LEM) (interconnect harness A) (interconnect harness B)	1. Before removing interconnect harness, perform following: a) Set circuit breaker CB1 on ac power protection panel (on back of OIA) to OFF. b) Disconnect 56P21 of interconnect harness from jack 35A1J1 on IMU. c) Connect portable temperature controller to jack 35A1J1 on IMU. CAUTION: Exercise extreme care when connecting harness plugs to PGNCS components to minimize possibility of pin damage during mating.	NOTE: JDC's 12603 and 12606 contain procedures for partial connection of interconnect harness. The remaining connections are made during repair verification checkout.	

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Table I. Removal and Replacement Procedures (cont)

Component to be Removed or Replaced	Remarks	Replacement Requirements	
		Electrical Connections	Mounting Screw Torque (inch-pounds)
(cont)	2. To install interconnect harness, perform JDC's 12603 and 12606.	See JDC's 12603 and 12606.	See JDC's 12603 and 12606.

JOB STRAIGHTENING OF PIN CONTACTS | JDC 18080 REV. A PAGE 1 OF 10 | INITIAL TDRR ——— DS PGS —

SUBSYSTEM G AND N SYSTEM | ASSY.

DESCRIPTION Procedures for straightening bent pin contacts of Hughes and Deutsch connectors

Rev. Ltr.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA	REFERENCES
A	3-27-68	35958	All	-	EA	-	
							IMPORTANT See below
							INTERVAL As required
							TOOLS AND MATERIAL Optical Gage, GB 760978 DC-4 Silicone Grease, MIL-S-8660

IMPORTANT: 1. Hughes pin contacts bent less than 5° may be used without straightening; pin contacts bent less than 20° may be straightened only once; pin contacts bent beyond 20° may not be straightened. Deutsch pin contacts bent up to 10° may be straightened only once; pin contacts bent beyond 10° may not be straightened. Pin contacts containing compound bends (2 or more bends), either before or after straightening, must be replaced.

2. Review data package to insure that a pin contact requiring straightening has not been previously straightened.

3. Record the pin number, connector number, connector type, and contractor of pin contact which is straightened on discrepancy report 675.

VERIFICATION WITH SIDL REQUIRED BEFORE USE

DATE _____

1. Check alignment of pin contacts of connectors listed in table I as follows:

NOTE: The reticles and adapters for optical gage GB760978 were designed for Deutsch connectors only. When checking pin alignment of Hughes connectors, interpolation is necessary as specified in procedure for Hughes Pin Contacts. Use eyepiece of optical gage GB760978, without adapter, and microfilm GB765637 when checking pin alignment of Hughes connectors.

a. Select reticle comparator or microfilm GB765637 (part of optical gage, GB760978) with a mask diameter D, which is slightly smaller than inside diameter of connector (see figure 1). Insure that reticle comparator pattern is same as pin pattern of connector being checked.

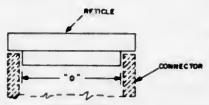

Figure 1.

b. Attach selected reticle comparator to magnifier. Place magnifier on connector as shown in figure 2.

c. Determine pin alignment using magnifier as follows:

NOTE: Care should be taken when viewing through magnifier so that parallax does not give effect of bent pins. Move connector to various positions in order to minimize effects of parallax.

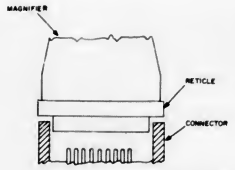

Figure 2.

HUGHES PIN CONTACTS

1. Rotate magnifier on connector until a straight line on reticle comparator is aligned to one row of pins. Position magnifier such that reticle of bent pin is midway between adjacent pins (see figure 3).
2. If axis of pin falls within center circle, pin alignment is satisfactory (see figure 3). If axis of pin falls between inner and outer circles or if edge of pin falls within outer circle, pin requires straightening (see figures 4 and 5). If edge of pin falls outside of outer circle, pin cannot be straightened and requires replacement (see figure 6).

DEUTSCH PIN CONTACTS

3. Rotate magnifier on connector until three lines on reticle comparator align with rows of pins (see figure 7). Select a position which allows maximum number of pins to appear within inner circles on reticle comparator.

DATE _____

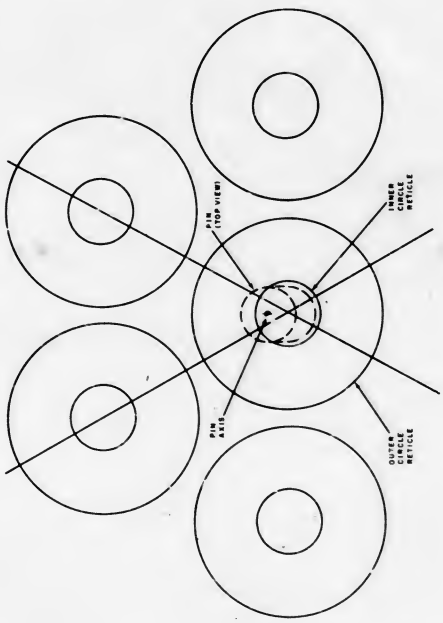

Figure 3.

DATE _____

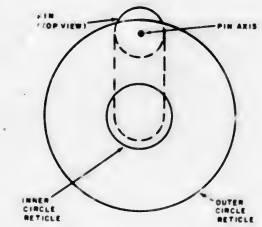

Figure 4.

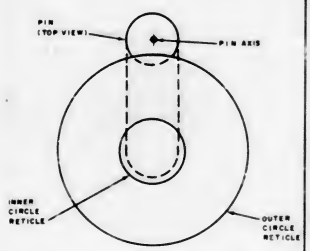

Figure 5.

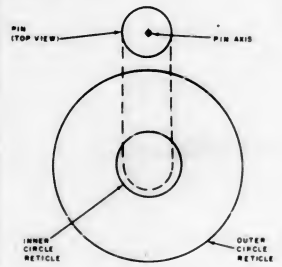

Figure 6.

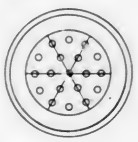

Figure 7.

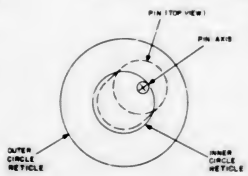

Figure 8.

DATE _____

4. If axis of pin falls within center circle, pin alignment is satisfactory (see figure 8). If axis of pin falls between inner and outer circles, pin requires straightening (see figure 9). If axis of pin falls outside outer circle, pin cannot be straightened and requires replacement (see figure 10).

Repair Procedure

2. Straighten bent pin using a suitable tool which will not further degrade the contact by denting or scratching the plated surfaces. The bent contact may be straightened with a specially designed tool, an adapted plastic tool, or a mating socket contact where feasible.

3. After the contact has been straightened, apply a thin film of DC-4 silicone compound to the area where the bend occurred.

4. Remove all excess DC-4 silicone compound from pin contact.

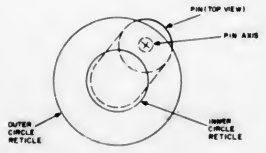

Figure 9.

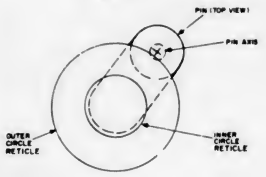

Figure 10.

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Table I. List of Connectors

Location	Reference Designation	Connector Type	Contractor
	BLOCK I		
AGC (inside)	05A7J2	Deutsch	RAY
AGC to PSA and G&N to Spacecraft Harness	05A5P1	Deutsch	RAY
	05A5P2	Deutsch	RAY
	05A5P3	Hughes	RAY
	05A5P5	Deutsch	RAY
	05A5P6	Deutsch	RAY
	05A5P7	Deutsch	RAY
CDU	40A1P1	Hughes	AC
	40A2P1	Hughes	AC
	40A3P1	Hughes	AC
	40A4P1	Hughes	AC
	40A5P1	Hughes	AC
Control Electronics	50A4J1	Hughes	AC
D and C Electronics	50A3J1	Hughes	AC
Eyepiece Stowage Unit	15P1	Hughes	KIC
	15J1	Hughes	KIC
	15J2	Hughes	KIC
	15J3	Hughes	KIC
G&N Harness	56J1	Hughes	AC
	56J2	Hughes	AC
	56J3	Hughes	AC
	56J4	Hughes	AC
	56J5	Hughes	AC
	56J6	Hughes	AC

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Table I. List of Connectors (cont)

Location	Reference Designation	Connector Type	Contractor
	BLOCK I (cont)		
G&N Harness (cont)	56J8	Hughes	AC
	56J9	Hughes	AC
	56J10	Hughes	AC
	56J21	Deutsch	AC
	56J22	Deutsch	AC
	56J23	Deutsch	AC
	56J24	Deutsch	AC
	56P1	Hughes	AC
	56P4	Deutsch	AC
	56P5	Deutsch	AC
	56P8	Deutsch	AC
	56P9	Hughes	AC
	56P10	Hughes	AC
	56P13	Hughes	AC
G&N Indicator Control Panel	50A1P1	Hughes	AC
IMU Control Panel	50A2P1	Hughes	AC
Main Panel DSKY	05A8J1	Hughes	RAY
Navigation Panel DSKY	05A6P1	Hughes	RAY
OUA	65A1J1	Deutsch	KIC
	65A1J2	Deutsch	KIC
	65A2J1	Deutsch	KIC
OUA Eyepiece Heaters	65A1P1	Deutsch	KIC
	65A2P2	Deutsch	KIC
	65A2P3	Deutsch	KIC

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Table I. List of Connectors (cont)

Location	Reference Designation	Connector Type	Contractor
	BLOCK I (cont)		
SCA	30A1J1	Hughes	AC
	30A1P1	Hughes	AC
Tracker Electronics	45A12J1	Hughes	AC
	BLOCK II		
"A" Harness	56P1	Deutsch	AC
	56P2	Deutsch	AC
	56P3	Deutsch	AC
	56P4	Deutsch	AC
	56P5	Deutsch	AC
	56P6	Deutsch	AC
	56P7	Deutsch	AC
	56P8	Deutsch	AC
"B" Harness	56P13	Deutsch	AC
	56P14	Deutsch	AC
"C" Harness	56P12	Deutsch	AC
"D" Harness	56J1	Deutsch	AC
	56J2	Deutsch	AC
	56J3	Deutsch	AC
	56J4	Deutsch	AC
DSKY	05A2J9	Deutsch	RAY
"E" Harness	56P24	Deutsch	AC
"F" Harness	56P23	Deutsch	AC

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Table I. List of Connectors (cont)

Location	Reference Designation	Connector Type	Contractor
	BLOCK II (cont)		
"G" Harness	56J6	Deutsch	AC
	56J7	Deutsch	AC
	56J8	Deutsch	AC
	56P20	Deutsch	AC
	56P21	Deutsch	AC
	56P22	Deutsch	AC
	56P32	Deutsch	AC
"H" Harness	56J5	Deutsch	AC
	56P25	Deutsch	AC
Indicator Control Panel	50J1	Deutsch	AC
OUA	65A1J1	Deutsch	KIC
	65A1J2	Deutsch	KIC
	65A2J1	Deutsch	KIC
OUA Eyepiece Heaters	65A1P1	Deutsch	KIC
	65A2P2	Deutsch	KIC
	65A2P3	Deutsch	KIC
PEA	35A2J14	Deutsch	AC
SCA	30A1J1	Deutsch	AC
	30A1J2	Deutsch	AC
	30A1J3	Deutsch	AC

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Table I. List of Connectors (cont)

Location	Reference Designation	Connector Type	Contractor
	LEM		
"A" Harness	56P5	Deutsch	AC
	56P6	Deutsch	AC
	56P7	Deutsch	AC
	56P8	Deutsch	AC
	56P9	Deutsch	AC
	56P10	Deutsch	AC
	56P11	Deutsch	AC
	56P12	Deutsch	AC
	56P13	Deutsch	AC
	56P14	Deutsch	AC
AOT Cable	65P1	Deutsch	KIC
"B" Harness	56J1	Deutsch	AC
	56P15	Deutsch	AC
	56P16	Deutsch	AC
	56P17	Deutsch	AC
	56P18	Deutsch	AC
CCRD	50J1	Deutsch	AC
	50P1	Deutsch	AC
DSKY	05A2J1	Deutsch	RAY

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DESCRIPTION

Rev. Ltr.	Date	TDRR NO.	PAGES REVISED JDC	PAGES REVISED D.S.	APPROVAL MIT	APPROVAL NASA	REFERENCES
A	1-4-68	35365	All	-	FAA/D	-	
							IMPORTANT
							INTERVAL
							TOOLS AND MATERIAL
							See appropriate section of JDC.

TOOLS AND MATERIALS:

1. Vacuum cleaner
2. Syringe, 100cc
3. Brush
4. #20 Hypodermic needle
5. Nylon or wood probe
6. Nitrogen, super dry, per MSFC-234 or BB-N-411, Type I, Class I, Grade B (soft consumables list #G.16.1)
7. Trichlorotrifluoroethane (Freon), meeting or exceeding BB-F-671a, Type F-113 (soft consumables list #D.25)

NOTE: Tarnish or discoloration of contacts in Malco and Malco-National connectors is acceptable when corrosion salts, decaying or pitting, or flaking of the plating is not observed when viewed under 30X magnification.

NOTE: Deutsch and Microdot connectors must be lubricated in accordance with JDC 18079 upon completion of connector cleaning.

VERIFICATION WITH SIDL REQUIRED BEFORE USE

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1. Remove DC-4 silicone grease from connector contacts in accordance with JDC 18081.

CAUTION: Extreme care must be exercised to prevent lodging of contaminants in inserts and female contacts of connectors.

2. Vacuum connector with portable vacuum cleaner to remove loose contaminants.
3. Use syringe to air blow contaminants from connector while collecting particles with portable vacuum cleaner.
4. Brush connector with soft-hair brush while collecting particles with portable vacuum cleaner.

NOTE: Perform steps 5 through 9 only if contaminants are present after performance of steps 2, 3, and 4.

CAUTION: Extreme care must be exercised to prevent damage to connector contacts while probing.

5. Use nylon or wood probe to remove contaminants while collecting particles with portable vacuum cleaner. Do not probe inside socket contacts.
6. Remove needle from syringe, fill syringe with Freon, and flush connector vigorously using syringe to dislodge contaminants and to solubilize oils and grease.

CAUTION: Do not use nozzle with smaller orifice and do not increase nitrogen pressure beyond limits specified in steps 7 and 8. Excessive pressure may damage connector contacts.

7. Connect nitrogen supply to hose and nozzle having an orifice of 1/8-inch.
8. Adjust nitrogen supply regulator valve for a pressure of 100 psig.
9. Dry connector thoroughly with nitrogen.

CLEANING OF COMPONENTS

TOOLS AND MATERIALS:

1. Trichlorotrifluoroethane (Freon), meeting or exceeding BB-F-671a, Type F-113 (soft consumables list #D.25)
2. Isopropyl alcohol TT-I-735 (soft consumables list #D.23)
3. De-ionized water
4. Q-tip applicators
5. Kimwipe tissues

NOTE: Kimwipe tissues are used as applicators on large surfaces; Q-tips are used on small surfaces.

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CAUTION: Protective gloves shall be worn when handling aluminum-painted surfaces.

10. Clean component of excessive finger prints, grease, and other contaminants as follows:
    a. Apply freon TF-113 to surface with clean applicator.
    b. Dry surface with clean applicator.
    c. Wash surface with clean applicator and de-ionized water.
    d. Dry surface with clean applicator.
    e. Wash surface with clean applicator and isopropyl alcohol, freon TF-113, or equivalent.
    f. Immediately dry surface with clean applicator to prevent streaking.

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